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NEWSPAPER

NEWS IN BRIEF

DP Cited for Drop In Welfare Rolls

NEW YORK – The welfare rolls declined here by 17,292 cases in February and officials credited the record-breaking drop to tighter management and computerization.

It was the fifth consecutive month in which the number of people on the welfare rolls dropped and resulted in a savings to the city of $777, 213 over the previous month, officials said. Computerization of the city's $1.2 billion income maintenance program, scheduled to be completed in July, has helped reduce agency errors and eliminate duplications, officials explained.

When the program is completed, welfare workers will have instantaneous data on clients and their eligibility.

Inmate Programmers Save State Almost $750,000

NORFOLK, Mass. – The Norfolk Computer Programming Group (NCPG), a group of inmate programmers at Norfolk Prison here, has saved the State of Massachusetts almost $750,000, according to George Magrath, NCPG program coordinator.

Over the past three years, NCPG has provided virtually free programming to such institutions as the cities of Newton and Quincy, the Department of Civil Service, the Arlington school system and the Massachusetts Hospital Association, Magrath said.

The program was established in 1968 under the direction of John Payton of Honeywell but was run completely by the inmates. Participants were taught three basic computer courses after which they began work as applications programmers for various governmental agencies. Experienced inmates teach new members of the program.

The incentive for the program has been jobs upon release and it appears to be quite successful as far as rehabilitaton is concerned. Of the 25 members of NCPG who have been released, none has returned to prison. That compares with 75% of total prisoners returning, Magrath said.

On the Inside This Week

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'Facts' Blame Computer In Insurance Scandal

Special Programming Only Incidental

The Great Fraud: DP or Not DP?

By Alan Taylor
Special to Computerworld

LOS ANGELES – The recent Equity Funding Life Insurance Corp. scandal [CW, April 18] has been called the "first great computer fraud in history," and perhaps in the future, evidence will confirm this judgment. But the "facts" relied upon by the staff members of leading national publications to support their published analyses that this was a computer fraud do not add up.

Other story on Page 3

Many stories implicitly or explicitly condemned the data processing professional staff of the conglomerate as obviously guilty of either fraudulent programming, or perhaps almost criminal incompetence (which is almost as bad a reputation for a professional programmer to live with).

This happened despite the fact that:

- Special programming appeared to be only incidentally used, and was not a significant item.
- The reporters had not checked their understanding of data processing with outside sources who understand in-house service bureau operations, normal programming or testing techniques.
- The accountants and insurance investigators had failed to look at the files behind the input, thus giving the conspirators time to forge them – or to check on their accuracy later. And so these people could be regarded as the key to the scandal, rather than the data processing personnel.

Analysis

Billing Programs Suspected

The main accusation of fraudulent programming was based on the existence of billing programs that could select policy holders to be billed on a departmental basis, using a 2-digit key.

Other grounds for accusation were the volume of standard input processed by the normal program system, which in fact represented fictitious input, and the preparation, for a user-actuarial department, of a list of unused policy numbers, utilizing a standard utility report generator.

None of these "facts" involved any requirement for sophisticated data proc-

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L.A. County Sues Ampex For $4 Million

By Marvin Smalheiser
CW West Coast Bureau

LOS ANGELES – The Los Angeles County supervisors have filed a civil suit in Superior Court here against Ampex Corp. seeking $4.25 million in damages against the firm for not living up to an $8.1 million contract to provide a sheriff's video-file system.

The suit claims that Ampex broke its lease agreement in three ways:

- As delivered, the system is incapable of performing as the firm promised either in volume of work to be handled or in time expected.
- No acceptable documentation has been produced on how the system is to be used.
- No proper acceptance test procedure has been produced by Ampex.

The county has spent $628,000 in rent for hardware for the system, which was to be part of a $19.5 million system of

(Continued on Page 2)

Telex Turns to Documents To Prove IBM a Monopoly

By E. Drake Lundell Jr.
Of the CW Staff

TULSA, Okla. – Relying almost solely on previously secret IBM documents to prove its claim that IBM is a monopoly and has used monopolistic practices, Telex began its $1.2 billion antitrust case against IBM here last week.

Telex attorney Floyd Walker contended that before making any move against the independent peripheral equipment buyers IBM carefully charted the effect on its competitors in that market with "remarkable" accuracy.

IBM trial attorney Thomas D. Barr, of Cravath, Swain and Moore, claimed that if the court accepted the Telex definition of the market, it would have to find Telex also guilty of monopolistic practices.

He also contended that the actions which Telex said were anti-competitive were the result of technological improvements and not marketing considerations.

In the maneuvering before the case opened IBM had sought to keep most of the IBM documents Telex planned to use out of the public record of the case and possibly out of the case altogether, a move which would have destroyed most of the Telex evidence.

Judge A. Sherman Christensen, the presiding judge, ruled, however, that the documents should be admitted at the outset, but said IBM could later move that they be stricken from the record and therefore from consideration in the case.

Telex contends, Walker said, that "IBM has monopoly power" in the tape, disk, memory, printer and communications controller market and in the entire peripherals area. In addition, he said, "the principal complaints in this case have to do with marketing plans and strategies which have tended to eliminate Telex as a viable competitor in the peripherals business.

"Basically," he said, "these involve pricing in such a way by IBM of its products that the margin of profits left in the products for companies such as Telex has been so reduced that the companies can no longer continue to expand."

The IBM moves have made the firms in the business "dying companies," Walker said, and they would remain so unless "something is done to restore competitive environment to that which existed prior

(Continued on Page 5)

★ Special Report: Communications ★

Time Studies 'Mobile–ized'

Configuring a complicated communications network to meet one's individual needs is not an easy task. What is needed, above all, is extensive and dedicated planning. This special report looks at the users who have met the challenge successfully, and not always with the same tried-and-true methods. *See Page 27.*

By Ronald A. Frank
Of the CW Staff

APPLETON, Wis. – A motor home equipped with an on-line data communications terminal has changed traditional time and motion studies for many firms in Wisconsin.

The firm which provides the innovative approach to industrial engineering problems is Management Science, Inc.

When one of the firm's more than 40 clients wants to develop standards for an industrial operation, the motor home is rolled up to the door. A Sycor 340 terminal system is used to develop the required work standards. In order to obtain typical work flow information that in turn is entered into the terminal, Management Science representatives first produce a videotape of the actual operation. The videotape is less distracting than the original time-and-motion manual data gathering, according to Willard Kern, president.

'Film Editor'

When the tape is rerun inside the mobile data center, the important parameters are extracted by an operator who watches the tape, determines the important actions being taken by the worker, and translates this using the keyboard for

(Continued on Page 2)

Time and Motion Studies Get Moving

(Continued from Page 1)

entry onto the terminal's cassette. In addition to the terminal and videotape system, the motor home includes a card reader, printer and mag tape unit.

The entire process is based on special software, developed by Management Science, which generates English language instructions based on mathematical inputs.

When the operator in the "mobile computer lab" (as the company calls it) keys data into the terminal, the information is based on the movements of the worker who appears on the videotape.

The standards that are developed and printed out for the user in the mobile unit include standard costs, measurement of a "fair day's work," payment incentive levels for "piece work" operations and similar analyses.

The standard cost file of a job is based on the input coding. Elements and descriptions of work associated with assembly functions are generated into files by comparing the time required to perform a function with the cost of the operation.

The software data base that enables Management Science to produce short turnaround answers was generated with the Terminal Application Language (TAL) that is part of the Sycor system.

Engineers, Relax!

The Management Science services are not meant to replace resident industrial engineers. In most cases, the in-house people are trained when the initial analyses are done and programs are supplied for the client to continue to operate after the mobile van has left.

Usually after Management Science develops the system it then leases it to the client firm. The programs can be run either on the client's in-house CPU or with a terminal access to one of the several data bases maintained at area service bureaus by Management Science.

The Sycor system in the motor home operates on-line with a 370 at Acts Computing Corp. in Grand Rapids, Iowa. But any IBM "65K configuration" can handle the custom programs, Kern said.

The programs are currently running on 360s, 370s, Burroughs, Honeywell and other CPUs for the more than 40 clients, he added.

The mobile lab connects to dial-up lines using a DAA installed by the local phone company. In most cases the client will order the DAA ahead of time and for actual interconnection most firms have a phone jack in a conference room or somewhere in their building, Kern said. The equipment in the motor home is powered by a 4 kW generator.

The main advantage of operating on-line with the Sycor terminals is the elimination of data input preparation. But many of Management Science's customers run their jobs in batch mode.

The input data in the mobile lab is entered onto one of the Sycor cassettes and is sent to the Acts service bureau at 2,000 bit/sec using ICC modems, one of which operates in the motor home.

20% Savings

The programs usually run with either OS/Hasp or DOS/Power and the net effect is to reduce the industrial engineering function to 20% or less of more conventional study methods, Kern estimated.

Although the work study methods may be innovative, they usually have the backing of the workers involved. "We adapt to the workers, and we have a system that has been developed at a work pace rate that is acceptable to international unions," Kern said.

Instructions in English

One of the "positive communication points" of the Management Science system is a complete English language instruction sequence which is printed out in the motor home and given to the worker. The worker then can check that all parts of the job operation have been included in the analysis.

Among the clients which get Management Science services is an insurance company where the keypunch operation was optimized.

"We have universal math formulas and we put in specific variables that are object- and thing-oriented versus people- and pattern-oriented. And the variables can be used to describe any kind of job," Kern said.

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Small Banks, Beware of DP!

By a CW Staff Writer

SAN FRANCISCO – Smaller banks – those with under $25 million in total deposits – should be wary of turning to computer systems to automate their banking functions.

That is the message of a recent speech here by Frank Wille, chairman of the Federal Deposit Insurance Corp., before the 43d Annual Convention of the Independent Bankers Association of America.

Wille noted that a recent FDIC study showed that "a bank with $25 million in total deposits which automated its demand deposits, time deposits, installment loans, business loans and real estate loans tended to incur higher operating costs in all those categories than banks which had not automated.

"If a bank automated by setting up its own on-premise computers, operating costs were an average of 10.7% higher for demand deposits, 26.6% higher for time deposits, 13.6% higher for business loans and 12.7% higher for real estate loans than they were for banks that did not automate," Wille told the group.

County Sues Ampex for $4 Million

(Continued from Page 1)

record storage and retrieval, communications dispatch and microwave transmission.

The Ampex video-file system was to be used in the Oracle Program (Optimum Records Automation for Courts and Law Enforcement).

Ampex has denied charges that its equipment failed to fulfill the terms of its contract for videotape equipment.

Charles Steinberg, company vice-president and general manager for the audio-video systems division, said most of the equipment has been delivered and remaining components have been held up because the county has refused to permit their delivery.

He said the county, because of internal conflicts, changes of personnel and re-evaluation of the entire county regional justice information system, has repeatedly refused to meet with Ampex in its efforts to respond to the county's changing requirements.

A technical audit of the system last fall was made by Unicorn Systems Co., Los Angeles, on a contract from the county.

The audit found that the system did not meet the specifications for which the county had contracted.

Unicorn, which does systems design, analysis programming and technical auditing, said it found the system could not perform the functional tasks agreed to in the time frame Ampex said it could in its proposal and contract.

The contract was signed in March 1969. In December 1971 the county said Ampex was notified that its equipment did not comply with contract specifications and lease payments were stopped.

Suit Against Singer, Systemation Dropped

SAN LEANDRO, Calif. – Representatives of the International Chemical Workers Union, The Business Machines Division of The Singer Corp. and Systemation, Inc. jointly announced that the pending lawsuit by the union against Singer and Systemation has been dismissed by mutual agreement of the parties involved.

The suit, initiated by the Akron-based ICWU last fall, asked some $800,000 in damages in connection with the use of a computer supplied by Singer through its Cleveland office and software services provided by Systemation, also of Cleveland.

The announcement stated that "the lawsuit originated because of misunderstandings regarding the capability and use of the computer and software services which now have been resolved to the satisfaction of all parties."

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What Really Happened?--Analysis

Auditor Negligence, Fear of DP Called Keys to Fraud

By Alan Taylor
Special to Computerworld

LOS ANGELES – Four separate sets of fraudulent actions were being routinely entered on the computerized books of the Equity Funding Life Insurance Corp., but none of them involved the production of specialized programming for potential fraudulent purposes by the corporate DP staff until a final attempt to stave off rediscovery was made in the last week of March of this year.

The four fraudulent uses of the computer were:

- Reopening the previous year's books and adding new input (such as reinstatements, lapses, death claims, sales, etc.) until the results matched corporate aims.
- Accepting falsified, but correct, format input from user departments which created and maintained bogus policies.
- Preparing test files at the instructions of the actuarial department, officially for use in insurance-selling simulation studies, but actually used to create falsified input describing bogus policies.
- Accepting about 35 sets of falsified input and maintenance documents which resulted in dead policies being revived – accepted as having $3,000 to $5,000 surrender value and cashed in through dummy bank accounts.

All actions except the last one – which was apparently the work of some still untraced independent entrepreneur probably in the insurance company subsidiary – were being handled in order to provide management with data to support its claim as a strong, high-flying conglomerate.

The use of the computer appears to have two facets – how it assisted implementing in the fraudulent firm figures in fact, and how the auditors' fear of the computer was used by the conspirators to prevent the normal level of auditing from taking place, although it could have been done without any computer knowledge.

In March, with the new auditors already taking up position, a DP programmer, under protest, did program a listing which included only good policy details, but repeated each good policy about three times, and scattered them into different parts of the listing to hide the repetition. This listing made the amounts balance with the previously claimed policy totals which were input as program constants.

The major role of the computer appears to have been in its use to find out which policies the auditors were going to check on – so that microfiche of the policy documents could be forged in time – and the use of an official "stop-gap" policy-maintenance data processing system to permit evasion of full checking and reasonably allow reruns on the ground of "errors." In fact, the runs were to "document" false annual figures.

A minor role of DP was the improper use of a simulation study, The Model Shop, by the actuarial department, which was an independent user of the corporate system. Here, what were supposed to be fictitious Model Shop files of policies turned out later to be an elementary input-creation system for the major bogus policies. These major policies were only integrated into the main computer system last December, two or three years after the fraud started.

Eric Schulz, the DP department insurance system manager at the time of the integration, suspected what was going on and realized he had no proof. He also saw it was possible that Equity Funding Life would be able to pull out of the "reinsurance" business and thus make good on the policies. He himself started looking for a new job position while quietly seeking proof of a scandal. He is now working with new auditors to successfully reconstruct the actual annual figures since the firm went into bankruptcy early in April.

The independent frauds apparently were not known to the executives of the firm, but appear to have been the independent activity of some insurance-knowledgeable entrepreneur on the insurance company staff. The frauds started last Jan. 2, and have resulted in the company's paying out surrender values of between $3,000 and $5,000 on some 30 or 35 policies which had really been dormant for years. The payments were funneled via dummy bank accounts to some unknown person.

The big company-sponsored fraud system was perpetrated by Mass Marketing Office, situated on the 6th floor of the Union Bank Building. This apparently involved selling discount mass policies to employee groups, union locals, Knights of Columbus, etc. These policies were not treated like ordinary individual policies both because they often needed special billing, and did not need more than annual file updating.

The Teachers Annuities, for instance, were sold to school districts, and were sometimes billed on a nine-month basis instead of the usual 12-month basis, to fit in with the needs of the profession.

These policies with their low updating requirements were able to be handled

(Continued on Page 4)

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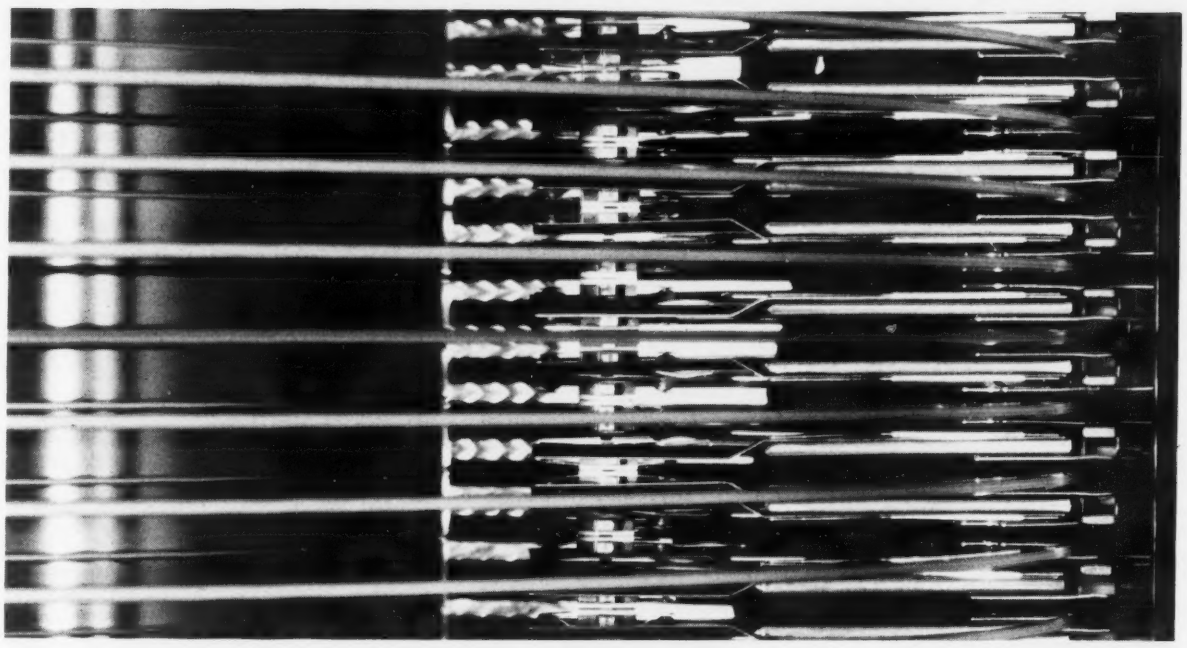

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Physical DP Tampering Discounted in Bank 'Shuffle'

By Don Leavitt
Of the CW Staff

NEW YORK – Continuing investigation into the apparent embezzlement of funds from the Union Dime Savings Bank [CW, April 4] has led bank officials to a better understanding of how the "shuffle" was handled and which accounts were affected.

The alleged theft did not involve any physical manipulation of the bank's computer or unauthorized changes in the software that supports the bank's operation, according to Chairman Walter R. Williams Jr.

Balanced System

DP was involved in the embezzlement, he added, only to the extent that customer account records stored on the computer were changed to keep the system in balance. These changes were made through unauthorized use of a teller's terminal and appeared to be valid transactions to the computer programming, Williams said.

Ironically, Williams noted, these transactions were captured by the system's audit trail routines with the results that – once the embezzlement was discovered – the affected records were "easily identified."

The bank's dual control system was circumvented at the branch level, Williams explained, when the supervisor of tellers gained unauthorized access both to the branch reserve cash supply and to a teller's terminal.

The thefts went undetected, he said, because the supervisor, who was unauthorized to use the terminal except for administrative procedures, in fact used it to enter transactions as required.

Spurious withdrawal notices were entered to account for cash allegedly taken from the reserve cash supply. Deposits and other adjustment transactions were used to restore the balance to the amount shown in a depositor's passbook, if the owner of one of the altered accounts appeared at the bank.

While some analysts have suggested that the embezzlement would have been recognized more easily if the system had been entirely manual, Williams disagreed sharply. In addition, he noted that ledger cards could have been replaced without being detected in that kind of environment, whereas the computerized audit trail records were inaccessible for alteration and have provided the bank with documentation needed to restore accounts to what they should be.

Auditor DP Fear 'Key' to Fraud

(Continued from Page 3)

directly by the actuarial department until last December (the actuarial department had the use of corporate computers on an open shop basis.) Originally in 1970 and 1971 these actuarial maintenance systems appear to have been held on a 5 in. by 8 in. card system. In 1972, the number of bogus policies jumped. Actuarial department-controlled computer runs were used to help create tape listings of the bogus policies.

These runs were done with a report generator, with the avowed purpose of creating the file data for the insurance sales simulation studies.

The only actual program known at this time that was written specifically to help in this input-creation, although it did not create such input, was a listing of unused policy numbers. This was created by DP reinsurance supervisor Peter Kaplan shortly after he joined the firm in January 1972 working under instructions of the actuarial department. The actuaries Kaplan recalled, last week said that they liked to have "safe" policy numbers that still looked like real ones, to use in their simulation studies.

A lack of real DP understanding by the actuarial department first aroused suspicions in December. Eric Schulz then felt that one of the Mass Marketing files of policies which he was being asked to merge into the now functional, but still stop-gap computerized insurance system, was apparently being created only hours before being supplied to him, rather than really coming from old records, as it was supposed to do.

Fear More Important

The fear of the computer was more important in the fraud operations than the minor programming or operational role it played in the late stages of the fraud.

The technique Equity encouraged the auditors to use was to request, by policy number, hard copies of the computerized records that it wished to inspect the next day. Instead of keeping this list of accounts secret until the computer was starting, or taking it themselves down to the computer operator and seeing it put into the system without being read by the Equity Funding officers, the auditors turned these lists over to the actuarial department personnel.

This advance knowledge gave the Equity Funding conspirators overnight to produce fake documents and photograph them.

National Journals Put the 'Mark' on DP

(Continued from Page 1)

essing methods, or indeed for any abnormal programming.

Cole Furr, director of a California data processing school, told *Computerworld* that his graduates certainly would be able to tell the difference between fraudulent programming, involving the creation of special insert routines, and the type of actions that appeared to be involved in the scandal.

The leader of the attack on the data processing area in Equity was the *Wall Street Journal's* Los Angeles staffer William E. Blundell. Data processing was fingered and found unquestionably guilty in an early paragraph of a long and very detailed story published April 2.

The *Journal* told its readers: "Special treatment of the (fraud) in data processing was imperative, for example, lest the wrong statements were sent to the wrong people."

Blundell told *Computerworld* last week that he had based his comments on the fact that the Equity data processing center had the ability to print bills by department and a random number generator.

"What," he asked rhetorically, "would an 'honest' insurance firm ever need a random number generator for?"

Generator's Job

Blundell's answer and why it proved DP guilt was that the generator was used to find non-active policy numbers which could then be allocated to the bogus policies. But, in fact, random number generators are standard routines used to help create test input and other normal data processing activities.

In any case, the listing of unused policy numbers was produced without a random number generator. It was made at the request of the actuarial department by a then-new employee, Peter Kaplan.

Kaplan told *Computerworld* last week that he had received, in the normal course of his work, other requests from user departments for reports, and that this incident certainly could not prove a charge of data processing involvement.

The *Journal* and Blundell took considerable care in the story not to go beyond what he thought he had heard from his EDP sources apparently entirely within the company.

Where he did not know exactly what had happened, he used phrases that did not directly indict the data processing area – but did not acquit it either.

Death Claims

For instance, one of the alleged fraud methods used in Equity was to falsely report that some of the people involved in the policies had died, and then to collect the insurance proceeds from a reinsurer. (Reinsurers bought the policies at 180% of the first year's premium.)

Blundell covered his ignorance of exactly how this was done by saying that "it is also known that on occasion a nonexistent policy holder was sent to his last reward via a forged death claim . . ." Other press coverage was not so cautious.

Newsweek magazine, however, in its April 23 issue, wrote about the scandal under the bold headline, "FRAUD: Conning by Computer."

"Even faked death certificates were programed [sic] into the computer, to cover the fraud trail further," ex-IBMer and *Newsweek* reporter Martin Kasindorf wrote. He told CW last week that the reference to "programing" was not in his original story, but had been added by editors in New York. The editors in New York apparently did not know that normally programmed systems would be able to record ordinary deaths, and so death claims would need no special programming to accept bogus input. So here it appeared to be the editors' alteration that had indicted the programmers. Kasindorf was guiltless here.

But Kasindorf himself seems to have been confused between ordinary and fraudulent programs.

Like the *Wall Street Journal*, he apparently thought that fraudulent – i.e., special – programs had to be written by the data processing people to prevent all the policies on a file from being billed at the same time, to create reports which either included or excluded the bogus policies!

The concept of utility programs, or normal program controls, which made any such specialized programming unnecessary, was apparently as unfamiliar ground for him as it was for Blundell.

1969 Sophistication

Kasindorf was "aware" of computer hardware, however. Part of his *Newsweek* story read, "Equity Funding had a highly computerized bookkeeping system even before the fraud started three years ago . . ."

He told CW last week that he did not know what equipment Equity Funding had at the time the fraud started, which he put at either 1969 or 1970. He did say, however, that equipment such as the IBM 360/30 would certainly not fit the description of a "highly computerized bookkeeping system." In fact, the 360/30 was the equipment installed at Equity in 1970, having just replaced the even less sophisticated Univac 1005 in 1969.

In any event, the work of the handling of the major bogus insurance policies was not integrated into the "sophisticated" corporate computer operations until December 1972, or two years after the fraud started. Small unsophisticated computer runs may have been used before then, but much of the updating was apparently handled manually.

But there was another way in which *Newsweek* implied programmer involvement and acquitted non-computer-oriented investigators.

In *Newsweek's* reports of California Insurance Comissioner Gleeson L. Payne's comments, Kasindorf quoted Payne directly as saying that he (Payne) would certainly call it a computer fraud, on the grounds that people could not build up hard-copy records so quickly in the "old days," and also because his examiners were not equipped to check out a computer run to see if it is authentic.

He was also quoted under the *Newsweek* alias of "one investigator" saying, "All in all, it was a beautiful job of programming."

As programming is well-known as something that only data processing professionals are skilled enough to judge today, such comments could easily imply that the data processing staff was directly writing fraudulent programs.

Factually, however, the major fraud was for years handled by hard-copy (or at least microfiche) methods – as Kasindorf had noted earlier and had made one of his bases for suspecting the involvement of data processing personnel! And Payne's investigators, or anyone else, would have had no trouble in uncovering the fraud even without any knowledge of programming.

All they would have had to do was insist on the immediate production of the bogus applications, medical examinations, etc.

This apparently was never done during the three years the frauds lasted! When the newly created forged records were produced (after being created overnight) Payne's investigators did not check on their accuracy – but only on their existence!

Similarly, the Illinois Insurance department failed to check on the existence of securities allegedly stored in Chicago banks, preferring instead to look only at printouts from California.

Ironically, none of the would-be press assassins of data processing apparently noted the two areas where some odd runs on the computer were requested, which, in hindsight, might have given the scheme away much earlier.

The first of these instances occurred in December 1972, three months before the "crash," when insurance system manager Eric Schultz found that the contents of files being converted from the earlier user-maintained systems, and supposed to go back some years, were apparently being created (under the guise of legitimate input for modeling insurance-selling operations) just hours before being handed to him as input data for the conversion then in progress!

He immediately started watching, making notes and trying to identify the real scope of the problem, as well as verbally complaining.

The second occasion came just one month before the crash in February.

Systems programming manager Frank Hyman became suspicious about the number of ways the 1972 figures were being rerun for the life insurance subsidiaries with different levels of cash reserves, with various products entered and producing twice as many sales, and with half as many sales actually occurring.

At the time, Hyman said, he questioned an official in the data processing department on the matter. He was told that a corporate austerity program was being designed, and that these additional runs were simulation runs to help plan the corporation's future course.

At the time, Hyman said, this temporarily satisfied him. Later, if any of these simulated printouts had actually been used as the published figures of trading for 1972 – which would have been theoretically possible just by sending out the simulated runs as real ones – the fraud could have become obvious to Hyman and perhaps to other DP people.

Equity Funding was handling the reserve calculation on the corporate computer for the first time this year.

But before the figures were ever published, which might have implicated DP, the roof had fallen in on Equity.

Telex Claims IBM Documents Back Monopoly Charge

(Continued from Page 1)

to what we claim to be predatory acts of IBM."

The first predatory move, Walker said, came with the announcement of the 2420 tape drive where the price for a unit was reduced in response to competition "without any decrease of manufacturing costs – but simply to reduce the marketing opportunities for competitors."

IBM could make such moves, he said, because it could spread the loss across its product line "without any real impact upon their total revenues."

For example, he noted that the 2420 Model 7 was priced at $1,000/mo but that the Model 5, which was introduced later and which was essentially the same unit, was cut in price about 40%.

The next move, he said, was the introduction of the 2319 disk unit, which he claimed was a reconfiguration of the 2314 with a 40% price reduction to meet the competition.

At the same time Walker charged that IBM protected its 2314 base by making the model number change so that it would not have to reduce the prices for similar equipment in the field in user installations.

Enter FTPs

Thirdly, he said, since the market share of the independents was still going up six months later, IBM then introduced the fixed-term lease (FTP), which cut prices another 16% to 30% and tended to lock the customer in and prevented him from choosing independent equipment.

All of the decisions were based on IBM projections of what would happen to the independents if IBM took no action and what would happen if it made the moves, he said.

The first Telex witness, G. Harry Ashbridge, Telex vice-president of business and market opportunities, testified that IBM documents showed the extent of IBM control of the market.

For example, one of the documents used as evidence by Telex showed, he said, that out of a total tape drive market at the end of 1970 IBM had 87%, or 39,600 out of a total of 45,300, while the "other equipment manufacturers" had only 5,700.

Similar documents showed that IBM had 94% of the total installed disk market at the time, he said, indicating that out of a total of 51,800 units IBM had 48,700.

Because of lower price units from the independents, however, IBM had only 9.1% of the revenues in the tape market at that time even though it had 13% of the units installed.

Quarterly product line assessments indicate, Ashbridge said, that IBM had rated its 2401 tape drive as "deficient" when compared with the competitive units, while the assessment showed that the 2420 would be "equal" to the competitive units in the field.

Before the 3420 tape drive unit was introduced, the document showed that IBM rated it "superior" to competition, but later had to revise that to "equal" to competition, he said.

At the same time, the IBM research from the document, Ashbridge noted, had rated the IBM 2311 disk drive as "deficient" when compared with the independents. The document also rated the 2314 disk drive as deficient, he said.

In the area of predatory practices, Ashbridge stated that the IBM documents themselves indicated that the 2319 disk drive was just a rework of the four-spindle version of the 2314 drive with no difference except the price reduction.

At the same time, he said, users in the field did not get the same price reduction even though the two units were essentially the same in all functional respects.

But when Telex reacted by lowering its price on its 2314 replacement, he added, IBM had lowered the price for all equipment then installed.

Using other IBM documents, Ashbridge then claimed that the products IBM had included in the fixed-term leases were those which had competition from independent suppliers, while those that were left out of the plan were ones without any competition in the field.

But immediately after the fixed-term plan was announced, Ashbridge said IBM raised CPU prices, a move that allowed it to make up for its loss in revenue on FTP leases.

The integrated controllers and memory on the 370/158 and 168 announcements from IBM also reduced the prices for these devices, Ashbridge indicated, without any functional change in their performance.

Even though IBM lawyers managed to keep Ashbridge from reading an IBM memo on the subject of CPU price increases and the fixed-term plan in open court, the memo said the price changes and the FTP "will probably be a wash in so far as business volume is concerned.

"Although there will probably be an adverse reaction on the part of some customers," the memo continued, "the net effect of FTP and price changes will not significantly increase his total cost and no system decreases are forecast."

In his opening statement for IBM Barr contended that "there is nothing" that supports the Telex claim that each of the peripherals markets was a definable market area.

"Now, we say that the law, sound economic theory and common sense demonstrate that Telex's version of the version will not wash and even if it proves what it claims here, even if it proves what it sets out to prove, it cannot succeed as a matter of law."

Follow the . . .

In the area of long-term leases, Barr said IBM's competitors had been offering such leases for a long time and that "IBM decided to follow that practice."

IBM, he said, is "experimenting" with the various lease plans trying to determine "what form of long-term lease is most satisfactory to it."

Barr felt the industry was presently undergoing a technological "revolution" that was allowing IBM to integrate more functions into its systems and said the technology made it economically sensible to do so.

In addition, he said, all of the Telex trouble was caused by a "manufacturing collapse" from the fall of 1971 to August 1972 and the problems it had were internal and not caused by IBM.

Aussies Eye Crime System

Special to Computerworld

CANBERRA, Australia – The Federal Government may put all its information on criminal activities into a computer.

Attorney General Sen. Lionel K. Murphy has set up a committee of public servants and academics to report to him by Aug. 1 on the plan.

The inquiry could be the first step toward amalgamation of all the federal law enforcement agencies in Australia.

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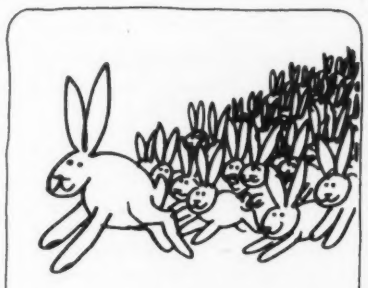

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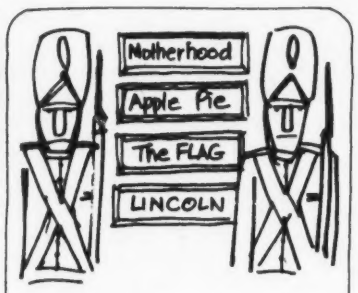
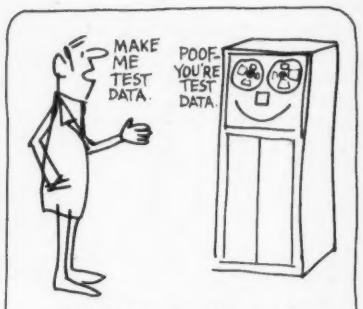
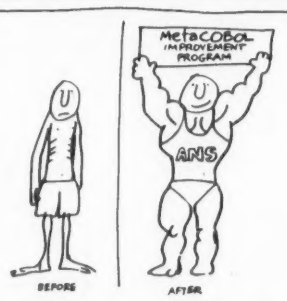


Allows installations to enforce their own COBOL standards.



Simplifies and automates the generation of comprehensive test data.



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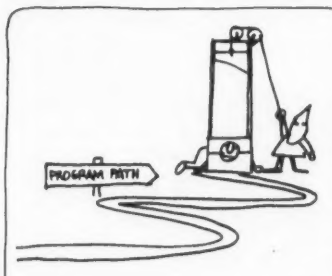
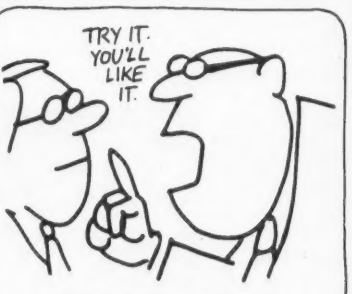


Documents COBOL program path execution.



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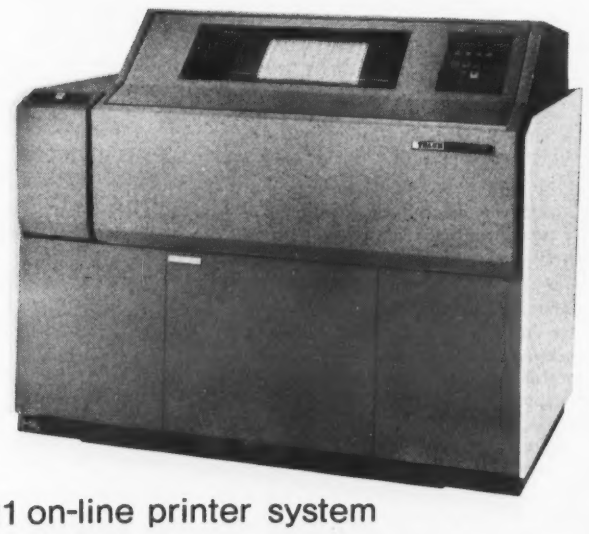


6721 on-line printer system

Ask your TELEX representative about the TELEX total system lease plan.

Adoption Data Bank Would Stress Speed

CW Washington Bureau

WASHINGTON, D.C. – A central data bank of all "adoptable" children in the country that could be used to match them with parents wanting to adopt children would be established under legislation introduced in the senate.

Sen. Jennings Randolph (D-W.Va.) told the Senate "there are thousands of homeless children throughout the nation who are awaiting adoption.

"I am . . . introducing legislation which would establish a national information exchange system in hopes that we can better realize the placement of these children into homes."

The information system would be set up under the Department of Health, Education and Welfare, according to the bill, and would be used both for children without families and those that have to be separated from their families by court action, Randolph said.

In "the shocking problem of child abuse," he noted, it is often necessary for children to be separated from their parents by the courts.

"In such cases it is important in the rehabilitation process of the child that an adequate and loving home be provided as soon as possible. Yet in many areas, it takes months before foster families can be found for these battered children," he said, noting that "often the result is an extended stay in a hospital or institutionalization."

Under the legislation there would be a central data bank on all adoptable children and a registry for families seeking to adopt a child.

Randolph noted that presently "there are many families wanting to adopt a child who cannot find children awaiting adoption in their area. They need only to contact the registry to find where children are available for adoption" with the new system, he said.

"There may be large numbers of homeless children in one area while a neighboring region may not have any children awaiting adoption," Randolph noted.

In addition, the bill also has provisions that would allow the U.S. program to be coordinated with similar systems in other countries, which would facilitate the adoption of foreign-born children, he said.

Medical Record Problems Probed

Special to Computerworld

SEATTLE – Washington State doctors have started investigating the problems of computerized medical records, and have organized a special medical record association to study the possibility of developing legislation concerning the confidentiality of computerized medical records.

Mrs. Lynn Regudon of the Washington Medical Record Association noted that two major problems are currently under consideration.

- **How can one correct errors entered into the computer without being charged with tampering with records, if a case is brought to court?**
- **What regulations should one impose to control release of computerized medical information?**

Readers wishing to respond to Regudon's questions are asked to write to Lynn Regudon, The Mason Clinic, 11180 9th Ave., Seattle, Wash. 98101.

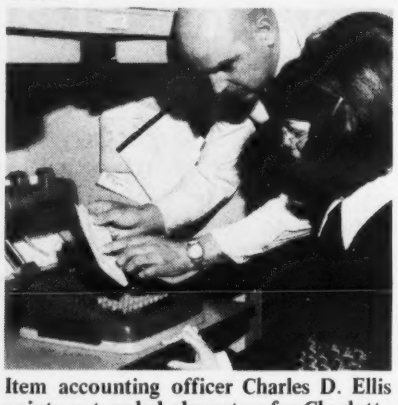
Civilian at Air Base Fits Right In

Special to Computerworld

CRAIG AIR FORCE BASE, Ala. – Charlotte Fikes is a civilian card punch operator, operating an IBM 026 card punch machine to transcribe supply and financial data for input to a computer.

Charlotte is also physically handicapped, having been born deaf and mute.

She works with about 50 different types of precoded transaction documents comprised of a wide variety of coded characters.



Item accounting officer Charles D. Ellis points out coded characters for Charlotte Fikes to transcribe.

Her deafness enables her to have total concentration where others might be distracted and her inability to speak does not keep her from communicating. She even has inspired the whole office force to learn spelling and sign language so they can "talk" with her.

Charlotte attended the Alabama School for the Deaf in Talledega, Ala., where she graduated from high school and completed a course in card punch.

Lower Prices? Mini Hopes It's No Bull

PHILADELPHIA – What do you get when you cross a minicomputer with a beef steer?

The answer could be a better price on beefsteak.

Amid all the explanations for the rising prices, one point often overlooked is the actual digestive chemistry by which grains and other foods are converted by cattle into beef on the hoof.

This approach may provide one of the best solutions through research being done at the Applebrook Animal Health Facility outside Philadelphia.

This facility is using a minicomputer to study meat-producing animals and the efficiency with which they convert food intake into protein.

Specifically, it hopes to learn how to improve the rate of growth (weight gain) and reduce the food required per unit of marketable meat to the consumer.

The experimentation involves testing for chemicals which selectively act on complex interrelated centers of the central nervous system and influence feeding behavior.

Sensors are mounted on the sheep and steers who have taken these chemicals with additional sensors attached to feeders and water cups.

These sensors allow a clocking of feeding times and amounts consumed to be entered by a Massey Dickison Data Acquisition System into a Varian 620/f.

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Suppose you have to make the recommendation for your company's next data entry system.

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The data processing manager is the guy most likely to have gripes. And who'll be most pleased with what the 3200 does. Like, our powerful software package which minimizes training, edits, sorts, reformats and blocks data (up to 2880 bytes) to tape concurrent with keying. It also permits formats to be changed simply by plugging in a cassette or by supervisory entry. Plus many more features.

The vp in charge of data processing will be pleased that our system has proven hardware, starting with our MAC computer. He'll like the 3200's options and flexibility, including 8 to 32 terminals. With 999 primary and alternate formats per terminal. And significant reduction of mainframe processing as a result of clean-edited and sorted input. And we service the 3200 ourselves.

Bill Would Coordinate Actions, Policies

Educational Technology Field Seen Outpacing Educators

By E. Drake Lundell Jr.
CW Washington Bureau

WASHINGTON, D.C. – Even though hardware capabilities seem to be moving ahead of software in the educational field, there is still need for research in both areas, according to Rep. Orval Hansen (R-Idaho).

Speaking on his bill (H.R. 6605) that would establish a Council of Educational Technology, Hansen noted "the conventional wisdom in the field of educational technology is that we are now in possession of more than enough hardware – computers, projectors, television sets . . . and that what is needed for realization of the full potential of educational technology is better preparation and understanding on the part of the educators."

But, he added, "this should by no means be taken to mean that educational technology hardware development is a final, completed accomplishment. The development of educational technology is still a fast-changing, dynamic field evolving more quickly than educators can digest."

While this situation leads to the development of more powerful tools for education, it also raises problems of standards and problems in matching the needs of educators to those of the equipment producers, he noted.

Research has shown that "although educators often complain that available technology does not fit their needs," Hansen said, "they have thus far successfully resisted providing manufacturers with precise descriptions of the qualities they need in products to facilitate the educational process.

"Neither have they accurately defined, in many cases, the instructional objectives they hope to reach through use of educational equipment," he said.

While he noted it was difficult sometimes for educators to define their exact needs in all cases, he said "greater precision on the part of educators in describing their needs can be achieved and would enhance the ability of manufacturers to respond to those needs."

At the same time he found that many of the standards in the field cannot be meaningfully related to classroom requirements of the educator.

"In some areas of educational technology," Hansen noted, "products are still in a rapid development state, evolving quickly as major and minor improvements and variations are introduced.

"Often the result of such technological improvements is the obsolescence of similar but older equipment, for which replacement parts and possibly even software can no longer be obtained . . . This plays havoc with long-range plans for integrating educational technology into the overall school program" in many cases, he said.

The council proposed by his legislation would help to overcome these problems, he said.

Coordination Needed

It would coordinate government agency actions and policies affecting the field of educational technology – both in-house and external projects. In addition, it would bring together representatives of various educational users of technology in a program that would try to identify and articulate common needs and concerns so they could be passed on to manufacturers.

In addition, the council would be charged with assessing the "quantity and quality of use of various types of technology in educational settings, including educational consumer reactions and evaluation of this technology," Hansen said.

The council would also encourage the development of needed equipment that is not presently available and would help to develop common formats and specifications for such devices.

Dairymen 'Milk' 24-Hour Hotline

CW Washington Bureau

WASHINGTON, D.C. – Dairymen around the country are presently calling into a computer-based system in Michigan to find the latest information on the best rations to feed their cows, the Department of Agriculture has reported.

The system, equipped with an audio-response unit, was accessed 4,733 times last year, the department said, by dairymen wanting the latest information on the best feed mix.

During the present period of rapidly rising feed costs and fluctuations in feed prices, the system has been most often used to help dairymen compute the "least costs dairy ration," according to Dr. Buel Lanpher, an extension economist in farm management with the department.

The computer system considers the latest costs for various feed mixtures to enable the farmers to find the least cost ration that can be formulated from the presently available feeds, he said.

The dairymen can access the system through Touch-Tone telephones from the area or county Agriculture Extension Service office, he said, and get an audio response from the system.

24-Hour Service

Charges for the service vary from between $5 and $15 for each analysis plus the cost of the long distance phone call, he said, noting the system is in operation 24 hours a day so that the calls can be made when the rates are the lowest.

Twenty-four dairymen in Ingham County, Mich., claim the system pays for itself by cutting the cost of feeding and they also report that 18 of them were able not only to cut the cost of feed, but also increase milk production by more than 190 pounds of milk a day with the system.

The system also has other farm-related programs for use by farmers, but the feed program seems to have been the most popular last year, the department reported.

In all, the "Capital Investment Model" developed for farms was used 917 times last year and the "Crops-Livestock Income Possibilities" program was requested only 390 times.

The department also noted the system was not only available to farmers, but could also be used by farm management consultants and bankers and others making financial decisions with farmers.

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The executive vp and the treasurer will like the price/performance picture. It's right. For lease or purchase. And they'll like the 3200's ability to grow with their company.

In fact, your praises may be sung all the way to the top. The president knows that when you choose a powerful system that's simple to operate, you've made a first-rate decision. And he'll like the money the 3200 saves his company.

If you'd like the complete picture, call W. S. Coverdale, (201) 757-1600. Or write him. LEC Data Management Systems, Plainfield, New Jersey 07061.

Manage your data; don't just enter it.

Lockheed Electronics

Preview: Lockheed's 3200 Data Management System will be demonstrated Wednesday, May 2, at the New York Hilton Hotel

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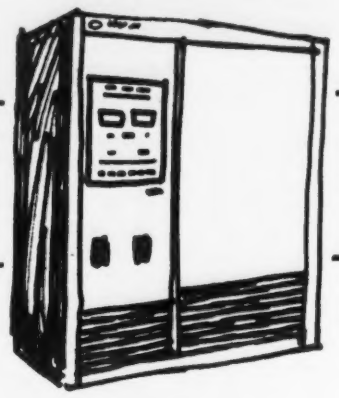

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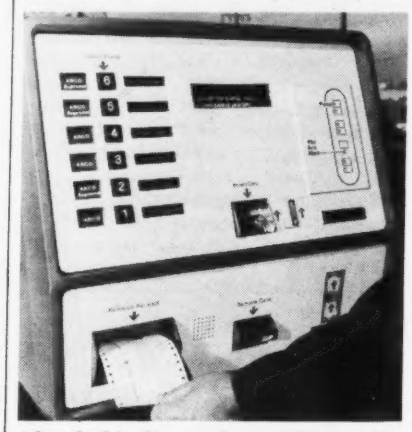
CW West Coast Bureau

LOS ANGELES – A computer-controlled, self-service gasoline station that accepts cash or credit cards has been opened in a suburb near here.

The station's 18 pumps are controlled by a minicomputer monitoring each transaction and linked by a telephone circuit to Atlantic Richfield's credit card center in Atlanta, Ga.

Developed by Atlantic Richfield in conjunction with Docutel Corp., Dallas, Tex.,



After fuel is dispensed, a receipt covering pertinent facts of purchase is prepared electronically. Printed information includes: amount and type of fuel purchased; price per gallon; date; time of day; pump used; refund due, if any; and station identification number.

the system handles the dispensing of fuel as well as the printing of a detailed receipt.

A customer inserts a credit card or cash in a control terminal on the pump island, selects fuel, fills the tank and obtains a receipt.

If he wants to use cash, there is a slot for $1 bills. An attendant will make change if necessary.

The credit card inserted into the pump slot is automatically verified at the credit card center in Atlanta. If a card is stolen, it will not be returned to the customer.

The credit check takes a few seconds and when completed the minicomputer directs preparation of a detailed receipt for the buyer.

The receipt gives the date, time of day, amount of purchase, type of fuel, price per gallon and number of the pump.

The station is part of an experimental marketing program. Additional computer-controlled stations will open soon in Los Angeles and East Coast areas.

ID Card Rule Sought

Special to Computerworld

WASHINGTON, D.C. – The International Standards Organization (ISO) has started a program aimed at developing international standards for ID cards.

The committee responsible for determining the U.S. positions on these subjects, Ansi X4, is currently seeking information on the use of ID cards throughout U.S. industry, in the areas of physical characteristics, security and computer codes involved.

Other information being sought by the committee includes the type of machine-sensible encoding to be used, including magnetic stripe, embossed bar code and optical bar code.

The committee explained that these cards, which are not to be used for credit card purposes, are used in conjunction with driver's licenses, hospitalization and programs such as Social Security.

Details of the survey are available from Edward M. Piehl, Secretary, Ansi Committee X4, CBEMA, 1828 L St. N.W., Washington, D.C. 20036.

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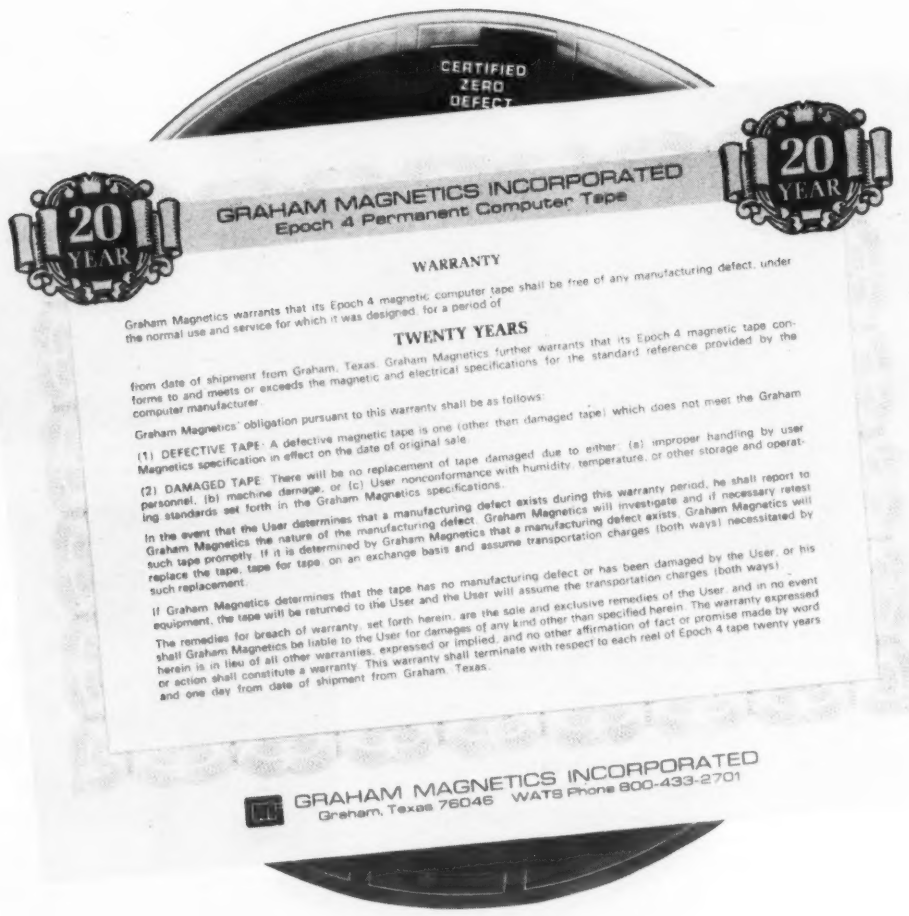
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(2) DAMAGED TAPE: There will be no replacement of tape damaged due to either: (a) improper handling by user personnel, (b) machine damage, or (c) User nonconformance with humidity, temperature, or other storage and operating standards set forth in the Graham Magnetics specifications.
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If Graham Magnetics determines that the tape has no manufacturing defect or has been damaged by the User, or his equipment, the tape will be returned to the User and the User will assume the transportation charges (both ways).
The remedies for breach of warranty, set forth herein, are the sole and exclusive remedies of the User, and in no event shall Graham Magnetics be liable to the User for damages of any kind other than specified herein. The warranty expressed herein is in lieu of all other warranties, expressed or implied, and no other affirmation of fact or promise made by word or action shall constitute a warranty. This warranty shall terminate with respect to each reel of Epoch 4 tape twenty years and one day from date of shipment from Graham, Texas.
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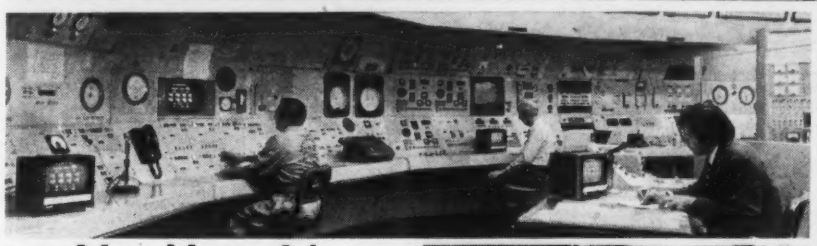

No Hot Air

A minicomputer coupled with an interactive terminal is saving close to $250,000/yr in the operation of one of the largest wind tunnels in the U.S. at the Air Force Systems Command's Arnold Engineering Development Center in Tennessee. Personnel now have individual CRTs which report test conditions (above). This DEC PDP-8e-based system saves from two to five minutes in setting each test condition. Seated at the remote terminal (right) are J.P. Christopher of Propulsion Wind Tunnel's Facility Engineering Branch and Gerald Allen of the facility's Plant Operations Branch.

Users Ride 'Intelligent' Bandwagon

By a CW Staff Writer

KANSAS CITY, Mo. – Monsanto Co. has chosen to link remote intelligent terminals to its central DP facility to avoid the proliferation of stand-alone systems and the accompanying systems staff for each, Dr. Ray Bowman told attendees at the data entry session of Computer Caravan/73 here.

The sizes of the 40 "terminals" linked to the IBM 370/165 and 155 in St. Louis range from 360/20s and 40s to small intelligent terminals, he said.

Many of the plants have no DP staff, he explained, and the intelligent terminal route will avoid having to create a staff in each location, and will provide central systems development capability, he explained.

The 165 handles prime time remote job entry while the 155 is on-line and can back up the 165.

In addition, data entry is performed by the user, thus benefiting from his familiarity with how the information should look.

Reduced Error Rate

Dick Baker of Chemagro also mentioned the benefits of reduced error rate from having the user departments enter data as they often flag incorrect reports before entering them.

One user in the on-line data entry workshop, Howard Sunderland of Western Union, said he had done several studies on error rates, and found that 90% of the errors occur after the data has left the source.

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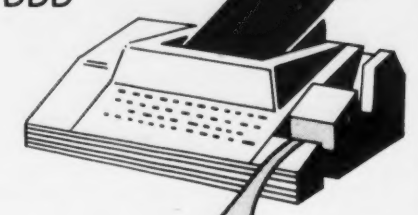

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Editorials

No Credit Here

As one of the early backers of the Fair Credit Reporting Act, we feel it is time for Congress to review the whole field of computer-based consumer credit reporting.

Apparently, according to a report from the National Commission on Consumer Finance, the Fair Credit Reporting Act has not completely met its original goal of providing accurate and timely credit information.

At the same time, the commission also noted a developing trend toward consolidation in the credit reporting field. Because of this, the commission recommended study be given to establishing credit bureaus as public utilities.

The Fair Credit Reporting Act is not as strong as it should have been.

Therefore, Congress should find ways to strengthen it in order to provide greater security for the information in the systems and better ways to ensure correct and up-to-date information.

Further, all computer-based systems that contain information on an individual should be required to send that individual a yearly report on pertinent information in its files – so he can check it for accuracy and timeliness.

However, there are grave doubts about the Commission recommendations for establishing credit bureaus as public utilities, unless their operations are more restricted and controlled than they previously have been.

The concept of a centralized data bank in any field frightens many people, because of the many errors found in smaller systems. In the credit area, an erroneous report in a centralized file could jeopardize a person's credit rating anywhere – and might be harder to correct than a record in one of several local agencies.

Whatever is done, however, should be done from the consumer's point of view – with an eye to protecting his rights before consideration is given to the problems of credit grantors.

A Safe Way to Change

A participant in the San Francisco Computer Caravan recently urged users to "discard the safe approach." It was understood he meant they should be prepared to try formats of other than 80 columns when dealing with key-to-disk operations.

The phrasing was effective – but should be put into the proper context. The idea is to be willing to depart from the old ideas which are dominated by an obsolete efficiency that no longer constrains us.

Terminals can be made more efficient and cost-effective if they are not constrained by outmoded concepts. Whether the terminal is used for key-to-disk, or for any other of the myriad terminal uses, is unimportant.

The concept of efficiency within need will often demand change. And change should not be that frightening to us. By now we should be professionally strong to control change and yet ensure safety.

We join with those who urge that we drop safety as the only goal, and familiarity as the only acceptable purpose in system design. We want efficiency, and we want to be able to change when we find it necessary. But we also want safety, and if the new ideas cannot provide it, then regretfully we must say the old concept must be maintained.

Finally Laid to Rest?

Letters to the Editor

Some Insights on Why CDP Exam Is Useless

Regarding Joseph A. Leubitz's letter [CW, April 4], I couldn't agree more with his assessment of the shortcomings of the CDP exam. I too sat for it this year, and I was as disappointed as he was, most particularly with the subjectivity of many of the questions on project management and on system design and analysis.

I think I can offer some insight as to why the exam, in its present form, is so superficial, and why it will no doubt continue to be virtually useless as a measure of a man's ability in data processing.

The CPA and bar exams are highly respected, comprehensive tests of an individual's knowledge and ability in the fields of law and accounting. To my knowledge, no one has ever seriously suggested that either of these exams could feasibly be graded automatically. DPMA, however, must grade the CDP exam using automation in order to make a profit from the administration of the exam.

If a valid test could be devised and administered in the manner that the CPA exam is administered, DPMA would be forced to charge many times the already-high $60 fee in order to operate the exam at a profit. I doubt this will ever come about.

Let's face it: data processing is one hell of a long way from becoming a profession in the sense that law, medicine, architecture or accounting are professions. I suppose the CDP exam is better than nothing at all, but to suggest that all CDP holders are professionals in their field is laughable.

Having sat for the exam, I know that any reasonably bright individual with any training or experience in DP could, by cramming from any one of the many study guides promoted by DPMA, easily pass it.

I only hope that Alan Taylor and his friends can tear themselves away from their diversion of zapping IBM long enough to bring about drastic changes in the CDP program; they are badly needed.

Roger C. Wilgus
Memorial Medical Center
Corpus Christi, Texas

Everybody Wants 'Professionalism'

Consider the burly dishwasher in a well known TV commercial. Up to his elbows in dirty dishes, he grins around his missing tooth and blurts, "Professionally speaking, this product gives more suds than any other." Now, there is a man who displays both qualifications and convictions.

It occurs to me the same guy could easily make commercials with nearly the same dialogue for any one of the many "professional" data processing societies now garnering columns of print in current DP periodicals.

Better yet, he appears as a "grass-roots" member of the dishwashing fraternity. So, change his setting to make him an old-time "professional" computer operator. He has seen multiple changes in hardware; upgrades, downgrades, compute power, throughput and so on . . . He has seen program changes, system refinements, software revisions and modifications to each of these. He has survived them all.

Now he speaks for a new organization, the Society of Computer Operators Familiar with Fiascos (Scoff). When he says, "Professionally speaking, my society has more to offer than any other" – wouldn't you believe him?

He could be representing one of the largest segments of the data processing community, couldn't he? The very name of his organization would lead you to believe he has the experience to deal constructively with the problems of his society, wouldn't it?

Ridiculous? Perhaps. On the other hand, the pseudo professionalism being exhibited by the majority of the DP societies and by those who want to form additional splinter societies has already established some pretty ridiculous patterns.

After all, the good ol' operator should be entitled to his professionalism, too, shouldn't he?

R.L. Stadler, CDP
Arlington Heights, Ill.

Get All the Facts, All the Answers

I've long enjoyed Alan Taylor's columns so I hope *Computerworld* and Taylor will accept this criticism not as a general indictment but as a plea to stay on target. In his March 28 column he finds U.S. Steel to be "the prime cause of the failure of Cobol," ostensibly because it has not provided adequate support to an employee who is its representative on Codasyl.

Now that may very well be the case, but since his three-quarter-page column fails to provide a *prima facie* argument, one worries lest he has joined the anti-corporate legions.

Given the same facts presented, the reader finds it far easier to view the representative, Warren Simmons, as the villain. Simmons is secretary of the Codasyl Executive Committee and chairman of the Codasyl Planning Committee (is there a conflict of interest there?), and uses a single filing cabinet for Codasyl records.

Several questions pop into the reader's mind: has U.S. Steel relied upon Simmons to outline his required support? What has he asked for and how has it responded?

If Simmons views his company's support to be inadequate, why appoint a fellow employee as vice-chairman? And, ultimately, why hasn't Simmons resigned his Codasyl positions since (regardless of the cause) he hasn't the resources necessary to carry them out?

What I am saying is that Taylor's facts do not support his conclusion, and that amounts to sloppy journalism. Please, let's get all the facts and then present them so as not to create questions that are left unanswered.

Gerard McBride

(other letters and viewpoints on Pages 13, 14 and 16)

Accuracy Not Always of Prime Importance In Some Information Processing Systems

The Taylor Report
By
Alan Taylor, CDP

Last week's Taylor Report considered the differences between data processing and information processing. At that time one point detailed was that the worth of data processing could be measured by considering how the system operated in relation to the processing instructions given.

The worth of the information processing system could only be determined according to the accuracy of the output – is it information, not misinformation?

This is a perfectly good distinction for one type of information processing system. Unfortunately, there are two types of such systems, and the suggested way of checking the merits of one information system just does not work for the other.

So, as information processors, we should learn to distinguish between the two systems before we start evaluating either type.

The object of the second type of information is to affect the behavior of individuals receiving the information. "Walk" and "don't walk" lights are good examples. The object of these systems is to ensure as well as possible the safety of the individual crossing the road.

This objective can be measured in several ways. The time that the "don't walk" flashes before the first car will cross the crossing – and whether it is long enough to permit a slow, but not loitering, pedestrian to cross safely – can be measured.

In a good information system the time will be long enough – in a bad one it will not. (Bad ones do exist. Near where I live one recently installed crossing system at the library "mixes" pedestrians and cars at the same time!)

Accurate Assumption

The accuracy being checked here is the accuracy of the assumption upon which the pedestrians are being asked to act. In the case of a "don't walk" sign, the assumption is that it may be unsafe to cross. In the case of the "walk" sign, the assumption is that it is safe to cross.

Do we therefore have to check upon the accuracy of both assumptions? Are both equally important?

Now we come back to the function of the system to find how to evaluate it. The function of a crossing system was previously stated as ensuring as well as possible the safety of an individual crossing the road.

The comparative priority of the two assumptions – that crossing when the "don't walk" sign is on is unsafe, and that crossing while the "walk" sign is on is safe – can be evaluated, and authenticated.

Such an evaluation would see that a breach of the "don't walk" sign – which would occur if it were on while it was actually safe to cross – would not directly break the function. It would not be dangerous for people not to walk during a safe period.

By contrast, it would be dangerous if people did walk during an unsafe period.

In evaluating a "walk/don't walk" information system, then, an evaluator needs to know a number of different items, including a functional definition; any created assumptions on the part of individuals receiving the various types of information; and the results, in terms of the function, of individuals basing their behavior on these assumptions.

Noticeably, there is nothing here that directly talks about the *accuracy* of the information given! Accuracy, therefore, need not be a determinant of an information processing process.

Inaccurate Yet Valid

In fact there are many cases where inaccurate information is quite effective in carrying out the role of information processing. At Regal Wallpaper in Massachusetts, there is a perfectly good information sign that says "all wallpaper must be returned within 30 days."

Now I know that that notice is inaccurate. Our house is covered with wallpaper from this shop, and we never returned it after having it pasted up for a month! And Regal never asked for it back either.

What the sign means – as anyone can realize – is that if something is wrong with a roll of wallpaper, and I want Regal to give me a credit on it, then it must be returned within 30 days.

So here is a perfectly good, yet inaccurate, information system. It certainly shows that accuracy is unnecessary. At the same time it could be argued that it would not hurt.

But can we even say that that much is true? Can accuracy be always correct – or can an information system which provides accurate output be faulted on these grounds alone?

This time I offer as an example a crowded theatre. A fire information system that called "Fire! Fire!" when a waste bin caught on fire in a projection room would not do an adequate job of maintaining its function – even though the accuracy was 100%

By contrast, a cry of "stop thief" used to stop someone about to walk under a moving unseen truck could be effective even though it was inaccurate.

Its very inaccuracy, which brought into play a high priority situation that made a pedestrian turn around (and therefore saved him), would make it a good information system.

In computers, as well as in dealing with data processing systems, we must also deal with information systems. As information processors we should be able to categorize them, to recognize them and to evaluate them. We should do this as a part of our profession, for how else can we call ourselves information processors?

True, some information systems can be evaluated on accuracy, but some cannot, as we have seen. How then can we be sure that we are doing a good job of evaluation? That is a topic I will be returning to shortly. In the meantime, alongside are another set of items to consider, and their information processing implications.

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Evaluate These Systems

Check your evaluation of some information systems. What criteria do you use to evaluate each item? What categories of information and data processing systems do you recognize here?

(1) A bank sends out a notice saying "try our 4% daily interest account."

(2) A bill arrives with a big arrow, pointing to an amount of money. The arrow is marked "pay this" in bold letters, followed by the phrase "and you will have nothing to pay next month" in small letters.

(3) Soldiers training at a boot camp are told to jump three feet in the air when the sergeant shouts "snakes."

(4) An accounts receivable report for the corporate accountant lists Alan Taylor as three months' delinquent.

(5) An accounts receivable report for a credit reporting agency lists Alan Taylor as three months' delinquent.

(6) The chairman of a corporation standing alone tells his stockholders that a suit against the corporation has been settled.

(7) The chairman of a corporation tells his stockholders that a suit against the corporation has been settled, and the corporation's attorney standing next to him on the platform says nothing.

Letters to the Editor

RPG Installation Operational Nightmare

Marvin S. Ruth's letter [CW, March 28] gets my support. I am in 100% agreement with his desire to "design the system for the customer."

In my 11-year career, I have yet to see an RPG or RPG II (or any other "quickie language" like Fargo, etc.) data processing environment that was not an operational nightmare, was developed from a total systems-oriented standpoint, considered the needs of management as a whole, or didn't give half the company and all of the accounting department heart failure when some key individual in computer operations wanted to take a vacation or leave the company.

Any system that does not provide management (and I don't just mean the accounting department) with alternative choices and operating control should not even be allowed in the door.

Norman F. Allen
Director, Information Systems
First Development Corp.
Sarasota, Fla.

Strong Staff Gives Guidance to Systems

I enjoyed the March 28 issue featuring non-IBM user likes and dislikes. However, in the article "Non-IBMer Must Develop Strong In-House Staff," there are one or two statements which I would like to clarify.

I am a firm believer in the necessity of building a strong in-house staff but not merely for the purpose being independent of the supplier when trouble arises. More importantly, the strong in-house staff is needed to give guidance and direction to systems efforts and to avoid dependence on the vendor for development of systems software and hardware plans.

Honeywell has been behind the industry in the past but is now making significant and rapid progress in producing good operating systems. The article attributed these thoughts to Honeywell's production of application packages, which are of little importance to us, since we have used very few.

William E. McMillen
Toledo, Ohio

Holding Hands Can Be Painful

Re: "It's the Hard and Dangerous Way to Break Into DP" [CW, March 28].

Gilchrest understated the problem. We went from unit record to computer and the vendor told us, "We will hold your hand all the way." They did, but what help is the blind in leading the blind?

To save our necks we hired them to send their expert. At times he had six or eight other experts with their heads together trying to get an updated file.

We too, have been looking at nobody!

Gradually we are getting everything redesigned and programmed, but it has taken three years and will take another to get where we should be.

Del Anderson
Data Processing Supv.
Home Health Education Service
Decatur, Ga.

A Few Kind Words For the Societies

In recent months I have heard a lot of complaints against DPMA, ACM and other societies. I too complain. However, there is some good in our associations and I feel we all should recognize these points.

For example, DPMA has accepted the challenge to present rewarding and educational exposure for its members in the field of data processing management. (These seem strangely appropriate for DPMA).

I am speaking of the seminars it presented at chapter level last year on management techniques and the current series of seminars, six in all, produced by Advance System, Inc. and sponsored by DPMA.

It is a videotape presented in a seminar fashion. We here in Indianapolis feel we have gained from our experience in these seminars. We look forward to more of the same. The DPMA should be congratulated and specifically the Central Indiana Chapter and its director of education, Lewis Marks.

Again DPMA has accepted the challenge to let the voice of its members be heard. The president, Herbert B. Safford, has invited the members to "speak up now if you have a suggestion or if something is not quite right." Local chapters are also offering this opportunity.

Central Indiana Chapter under the direction of J. Owens Brant is having a special monthly meeting for "DPMA Improvement." I urge every DPMA member to express his views, now. I should think other associations should take notice, especially ACM. Listen to your membership.

Cornelius M. Head
Indianapolis, Ind.

'Residual Value' Inappropriate Term

Regarding Dick Brandon's comments on investment tax credit on residual value [CW, April 4], it does not seem logical to view investment tax credit in terms of pre-tax dollars when relating it to purchase, which represents an outlay of after-tax dollars to the purchaser.

If his logic, or illogic, is applied to a situation of 50% ITC, for example, the residual value on day one would be 0 percent of the purchase price. There is confusion here between cash flow and pre-tax costing.

Also, the term "residual value," notwithstanding its wide use, is not appropriate. To the accounting profession it is synonymous with book value.

Residual or book values stem from the application of arbitrary depreciation rates to capital assets, such as computers, and can be – and in the case of IBM 360 computer leasing companies manifestly were – far afield from market or resale values.

In calculating ownership costs, estimated future market values are what must be cranked into the calculation. The after-tax difference between residual (book) value and proceeds from sale of the asset at "market" is applicable as a credit (if sold at a profit) or a debit (if sold at a loss) against the initial outlay.

Finally, any presentation of future value tables should emphasize clearly that the table for each specific model must be adjusted yearly.

Michael R. Nadurak
Greenwich, Conn.

Reexamination Every Five Years Might Save CDP

By Robert Higgins
Special to Computerworld

In my opinion, the Computer Foundation is dead – or at least is so hopelessly compromised that death is imminent and inevitable.

What the hell happens? Why did this bright hope of professional skills burn to a cinder, meteor-like, in less than three months?

I welcomed CF. I sat for the CDP exam five years ago (fighting my work demands to do so) not because it had great significance then but because I believed the idea was right and I wanted to strengthen my constructive criticism of the CDP program by appending CDP to my signature.

I am by temperament an ACMer rather than a DPMAer – I have attended DPMA meetings, and read and contributed to JDM, but my mix of interests and goals matches the ACM profile more than the DPMA profile.

I thank DPMA many times for initiating the CDP program, but this "parent-owns-child" resistance to the growing maturity of the CDP seems destined to destroy it or render it completely meaningless. People, have you no teen-age children? Can't you see the analogy?

I perceive in the history of the CDP program a small element of a "con game"

Viewpoint

played by such financial greats as Jay Gould and Jim Fisk: create something that is intrinsically of small value, hand it out to all your friends, then begin a propaganda campaign to convince the outside world that the "something" has great worth/value/significance.

The "grandfather" clause, the back-and-forthing on the college-degree prerequisite, and the recent challenge to the exam's validity all are relevant to this point.

But "con" artists succeed by masquerading as well-meaning amateurs.

5-Year Reexamination

Let me propose a simple, revolutionary change to the CDP program – reexamination every five years. I would then favor all kinds of "grandfather" clauses, including one permitting those who failed reexamination to continue trying indefinitely. This proposal breaks the deadlock on the continue vs. stop pending validity study – continue and study validity: any changes resulting from the validity study will be completely applied to all CDP holders within five years.

If the examination is discontinued for study, odds are it will never resume, because all the momentum will be dissipated. To back up my proposal, I will post a bond guaranteeing that I will retake the exam next year – if it survives the current troubles.

We claim to belong to a dynamic, kaleidoscopic, ever-changing profession – what's dynamic about a certification which, once obtained, is never renewed or reverified?

To Messrs. Harris and Swearingen I say: Is Mr. Nixon's example giving you dreams of dictatorial glory? Is there a lot of money, or a lot of power, or a lot of prestige, lurking where only you can see it?

Beware a sudden devaluation of the currency you are flinging around: if I do not see a clear reversal of CF's course, I will start doing four things:

- Prominently announcing myself as EX-CDP.
- Prominently announcing myself as EX-ACM.
- Encouraging all my associates to do the same.
- Organizing the resurrection of the computer foundation ideals safe from your power-grabs.

Robot-Like CEs Need To Learn to Practice Human Hand-Holding

By Nancy Foy
Special to Computerworld

With respect to *Computerworld's* April 4 editorial about IBM's field engineers having to be robots, I'd like to turn the issue around. The other side of the matter might be called "user's lib."

The real "new generation" improvement in the 370 is that it has been designed and built to be much more reliable and maintainable – a point we've overlooked in the political/judicial clambake since 1970.

The field engineer (or CE as IBM calls him) is no longer the remote doctor for the system; now his functions are much more nurse-like.

Viewpoint

Remember the sixties? Reliability was laughable and maintenance a constant, emotional problem. Applications were late, bureaus went broke, and the computer got a questionable reputation in business, mostly because the computer companies spent more energy on new technology than making the existing machines dependable.

The new systems are nearly idiot-proof, and that will indeed be a problem for the overqualified, overtrained young men, the "computer doctors" IBM is still hiring to do these nursing tasks. (I'd rather have my son making typewriters in an IBM factory than maintaining its computers!)

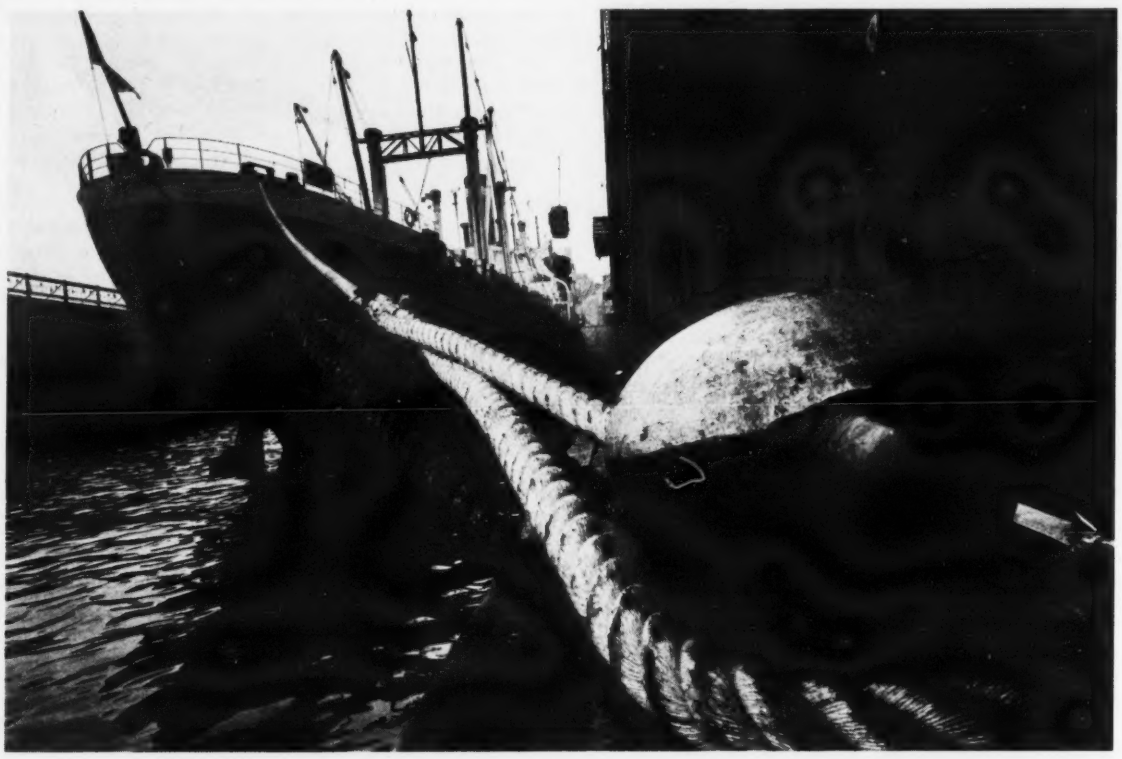
The manual for 370 maintenance is full of robot-like procedures. The CE arrives (less often these days), looks at a log in which the computer records every bit it has dropped along the way, then plugs in his floppy disk of "microdiagnostics."

Another printout tells him where the trouble is. He turns to the cited page in his manual, replaces the cited circuit cards in order until the computer reports a return to vibrant health. Most of the time cards are replaced before they go wrong, not after. Even severe problems can be handled normally without taking down more than a single partition. Total time elapsed? A few minutes.

Yes, it's a job with less technical challenge for the CE now. They'll have to learn to do more human "hand-holding" in the field, or hire less intelligent people.

Meantime, the user gets full use of the machine, and his maintenance is scheduled and efficient. Very few would want to go back to the good old days, even if it enriched the jobs of the CEs.

A more apt journalistic campaign might be to ask IBM to pass on some of the maintenance savings to the users – who are presently too happy with the sheer reliability improvement to bother making waves.



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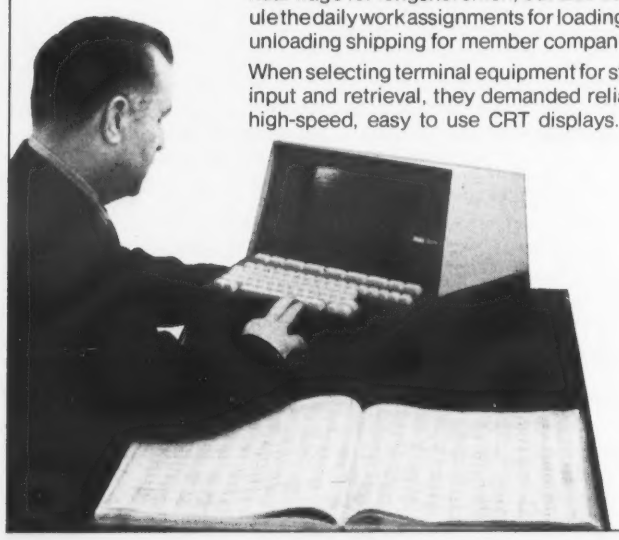

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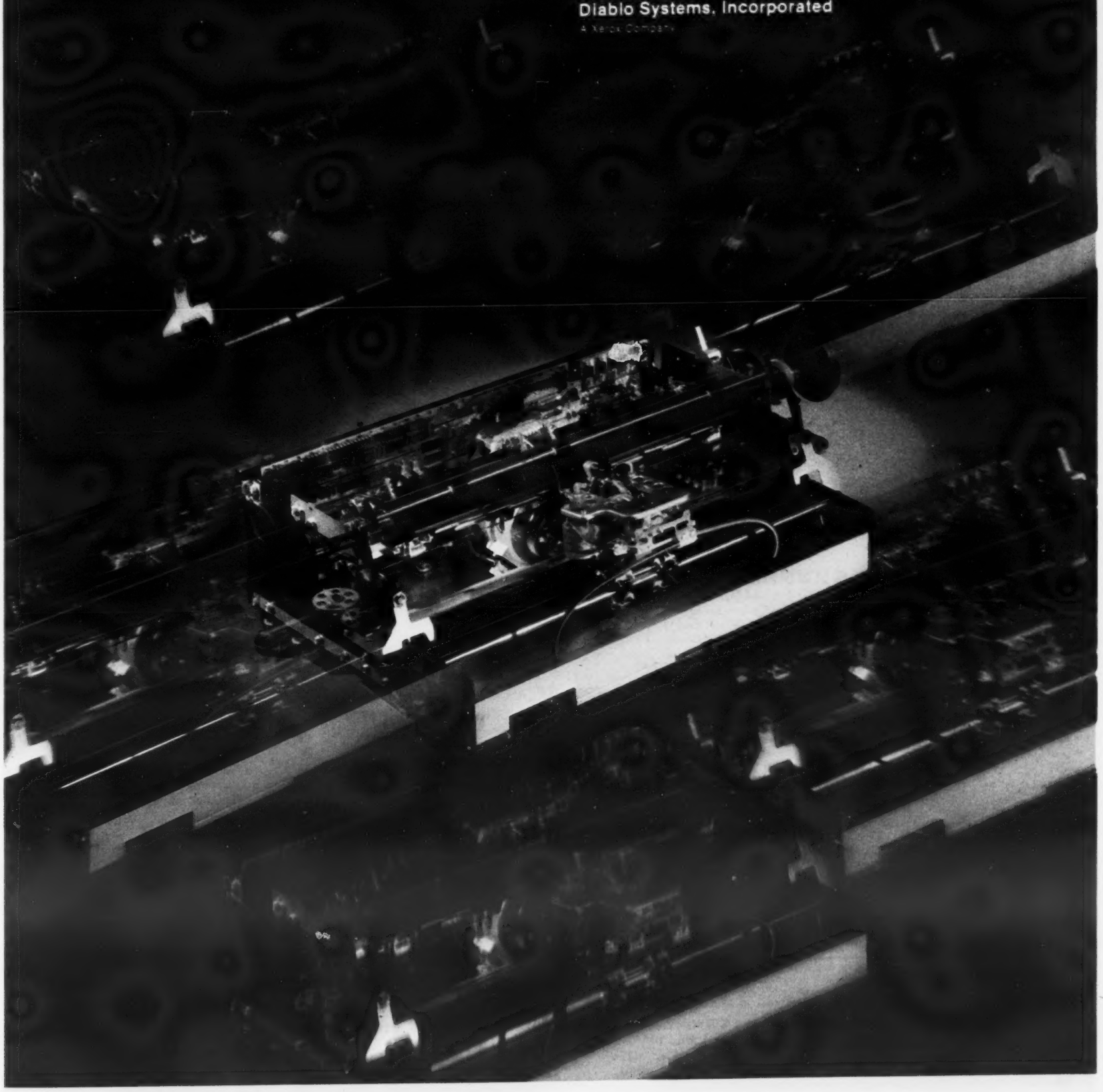

Or the Death of a Status Symbol

An Obituary on the Fated DP Certification Program

By Joseph T. Rigo
Special to Computerworld

It is time to recognize that the data processing certification program is dead and that the carcass is beginning to smell.

The program was ill conceived and ill directed. A rational justification for its continued existence never evolved. Death was due to natural causes.

Supporters generally contended that it would serve two measurably useful purposes:

- It would help employers evaluate job applicants.
- It would help everyone by denying professional status to incompetents.

Employers Disinterested

The most interesting thing about the first point is that it was seldom mentioned by anyone who actually hired programmers and analysts. At best, if pressed, they would say that it might be of some value in the distant future when all the bugs were worked out. Mostly, though, they didn't say anything. Their lack of interest was overwhelming.

For one thing, they had already had experience with tests and the people who take them. They felt the Programmer's Aptitude Test was, in most ways, an excellent exam. Some people did well in it. Others did poorly. The problem was that these were not necessarily the same people who did well or poorly on the job. In real work, personality factors became at least as important as an ability to manipulate symbols.

Viewpoint

No one was ever very enthusiastic about the quality of the certification exam. It was constantly being debugged. A few suggested that the DPMA was deliberately keeping it simple until all its members had their certificates framed.

. . . in Reality

DPMA members might be very good at whatever they do. But few were regularly practicing the skills that the test was meant to measure.

This leads to the question of who those people were who actually showed up for the tests. There is little reliable data, so I must go on personal observations and guesswork.

First, I suggest, it had strong appeal to people who were neither programmers nor analysts, but worked closely with those who were. This group included journalists, teachers, middle managers and up, and vendors of various support services. They were all marvelous people, I'm sure. They may have been practicing programmers and analysts at one time. They might even become so again.

In the meantime, they worried that their technical competence, like their youth, was slipping away. Or they tired of hearing slogans, such as "them what can, do; them what can't, teach/write/consult/etc."

They hoped that the certificate would provide the technical professional status that they did not have the opportunity to demonstrate in their daily work.

Second, the certificate appealed to the minimally qualified. This person knew just enough to get a passing score. He might have been fired from his last three jobs for incompetence. He wanted a certificate to convince another prospective employer that his previous managers just didn't understand him.

Third, there were the insecure. There are a lot of good people in this business who never go to college and worry about it. There are others who attended low prestige diploma mills and worry about it. Most outgrow this. Some never do. They constantly search for additional testimonials and credentials to prove that they are as good as the next guy. No certificate could solve their problems.

Finally, there were the good guys, the well-adjusted, self-confident programmers, analysts and managers who do good work and know it. Some of them got lured into the program by accident.

Others were genuinely concerned about their profession and saw certification as a valid, useful activity. They will not agree with anything I say in this obituary. I can only point out in return that very few of their colleagues displayed any interest whatever in certification.

These others felt they proved their professionalism every day in their regular work. They had no need for certificates from DPMA or ACM.

Wheat and Chaff

In my book, a professional is someone who gets paid for his work. Beyond that, some professionals are better to have around than others. The job market is quite effective in separating one from the other.

DPMA's vested interest in certification was obvious. As an organization, it was never accused of pioneering the leading edge of computer technology. By being first to define the standards of professionalism, it ensured that its members would have a good chance for admission.

ACM's interest was another matter. ACM was not about to admit that its members and their friends had anything to fear from a test of technical competence. Clearly then, it must have been worried about those other people – those people down the block who code payroll programs.

ACM never had much to offer the business programmer or analyst. It seemed to be afraid of contaminating its members.

Striving for Status

The certification program was never much more than an elaborate attempt to establish an official status symbol. Many good people got involved with it along the way, but no other, more useful purpose ever evolved. As a result, the program barely tapped its intended market, and it was never able to attract enough people to cover the costs of administering its tests.

Now the program is dead. The various organizations are still fighting over possession of the carcass, but the stench is getting stronger. Why don't we just carry the poor thing back into the trees and bury it before it gives the profession a bad name?

Joseph Rigo is a systems documentation manager.

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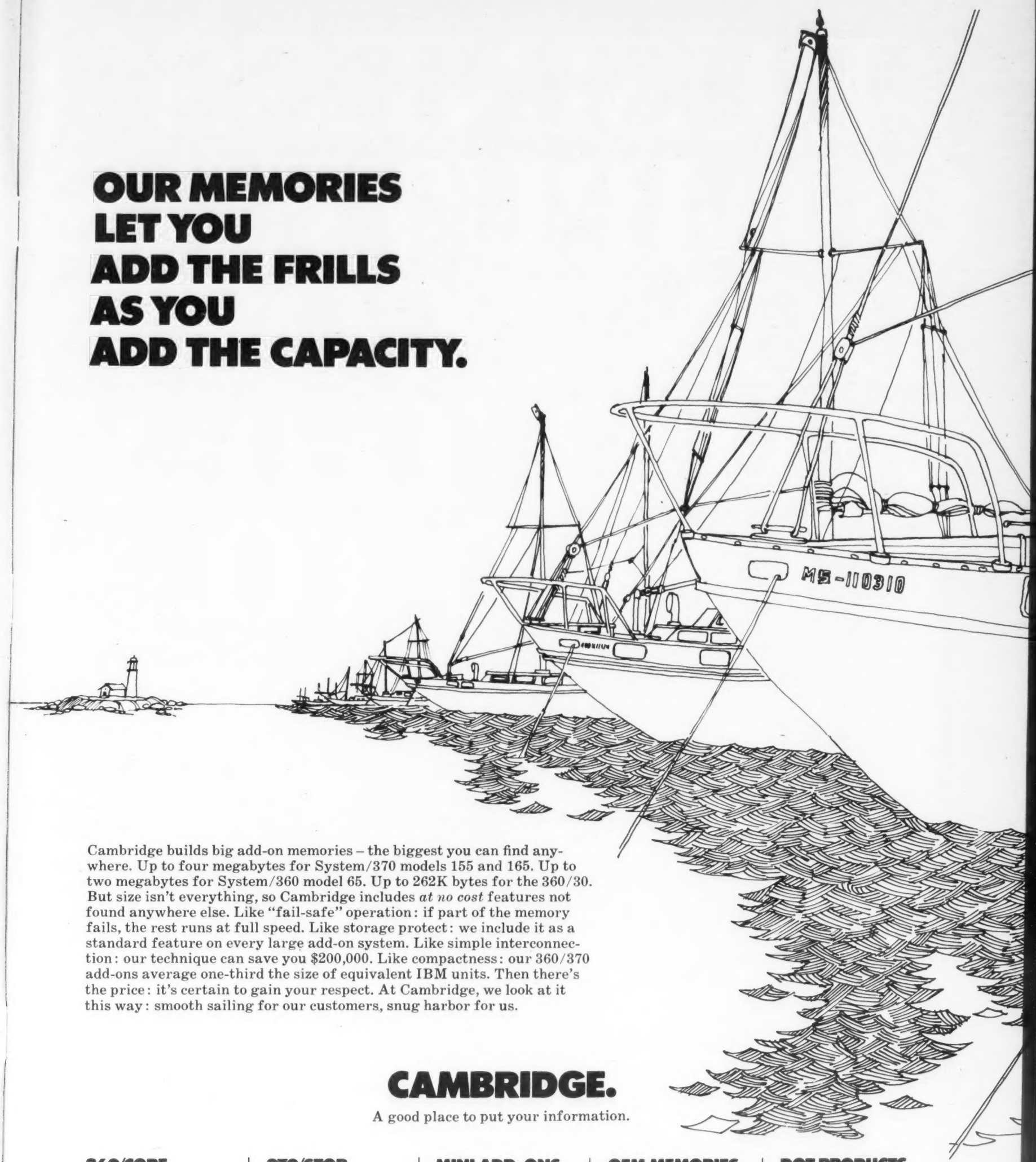

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Random Notes

ITS Takes Over HIS 1640s To Complement CDC 3300s

CHASKA, Minn. – The conversational power of the H-1640s recently acquired by International Timesharing Corp. (ITS) from Honeywell's own time-sharing operation will ultimately be available on the same network as the computing power of ITS's own CDC 3300s, a company source said recently.

The consolidation probably will not take place until the Honeywell units, now at HIS headquarters in Minneapolis, can be moved to ITS offices here in Chaska, the spokesman added. Once that move is made, subscribers to each of the now separate services will be able to access either type of CPU, on a program-by-program basis.

Expansion Eases Datamacs Use

PHILADELPHIA – Diagnostic messages have been expanded and technical manuals rewritten to make Datamacs, the test data generator package from Management and Computer Services, Inc. (Macs), easier to use, according to a company spokesman.

There are now separate diagnostic messages for each Datamacs-related coding error so that the specifications can be debugged more quickly. Datamacs can be used with source programs in various languages and is available for OS/360 users for $6,500, and for DOS users for $5,500.

Macs is at 104 Park Towne Place East, 19130.

Mark III Adds Financial Language

BETHESDA, Md. – Financial analysts can study pertinent data, perform calculations and make projections on an interactive basis, with the Financial Analysis Language (FAL) now available on GE's Mark III remote computing Information Service.

Complex algebraic formulas structured directly into FAL statements provide the user with a means of creating a complete system of recurring or one-time financial reports.

Based on Fortran, FAL's logic includes statements to control iterative execution, to alter the sequence of execution or to test for specified conditions.

Newsletter Issue Features APL

COLORADO SPRINGS, Colo. – Two years ago the *Computing Newsletter* began to devote the March issue to the subject of interactive computing. Increasing interest in APL has resulted in more than half of this year's special issue's being devoted to that particular language, according to editor Daniel J. Couger.

Copies of the March issue for each of the past three years are available for $3 each from *Computing Newsletter,* Box 9630, 80932.

Non-DP Managers Favor Effective MIS

By Don Leavitt
Of the CW Staff

OTTAWA, Ontario – Though middle-level management has often been called the main stumbling block to the development of management information systems (MIS), this assumption is not completely justified, according to Prof. Art Guthrie of Simon Fraser University.

A survey of nearly 2,000 Canadian middle-managers indicated that they see a need for MIS development. However, the need is still slight enough, Guthrie found, so that as a class the managers feel they cannot be expected to give the development task anv significant time and effort.

Organizational environment, rather than the background of the individual manager, appears to be the key factor in this attitude development, Guthrie added. In many cases, people in this level of management feel as if they are literally in the middle of something they can't control.

They feel squeezed, in many instances, between uninvolved, disinterested executive management on the one hand and overinvolved, overenthusiastic DP management on the other.

Almost 80% of the responding managers expressed a desire for heavy user-manager participation in the development work when it is done, but they aren't generally going to push hard to get the development started.

Many of the managers answering Guthrie's questionnaire recognized they could use more information when trying to make decisions, but the information has to be both relevant and concise to be useful. They shrink from visions of voluminous printouts of data "useful only to clerical minds."

MIS reports, as pictured by a number of the managers, can be extremely self-serving and leave no room for management intuition. "Computerized information systems are Parkinsonian panaceas for organizations incapable of understanding themselves," one manager wrote Guthrie.

"The existence of a formal information system tends to rigidify an organization around the data collected, making it less able to cater to changes in information requirements."

Several managers recognized what can happen if they don't take the time to work with the DP staff during MIS development. "Information saturation results simply because management has not adequately examined and specified what it wants, e.i., bad planning is rampant," according to one respondent.

Guthrie's work was funded by the Social Environment Planning unit of the Canadian Department of Communications.

Flowcharts and Decision Tables 'Harder Than Prose' to Interpret

UNIVERSITY PARK, Pa. – Problems stated in prose appear to be easier to interpret than the same problems stated in either flowcharts or decision tables and, according to professors T.C. Willoughby and A.D. Arnold, the superiority is measurable in time and correctness of interpretation.

In a recent issue of *Data Base,* the Penn State researchers also noted that flowcharts seemed to require less time to use than decision tables but that the tables may be superior in providing a thorough understanding of the problem to be solved.

Great Expectations

The professors had expected that decision tables could be both more quickly and more accurately interpreted than either prose or flowcharts. They were not concerned with which method might be a better source of information for programming, a problem being studied in a parallel project.

Based on the "interpretation" project, they concluded that since representatives of end-user departments were usually unsophisticated in the use of flowcharts or decision tables, "the preferable user-DP communication media is prose."

The original hypotheses were tested by asking respondents to read three problems and then answer questions related to the problems. In this case, the material was presented in three different forms with the same set of questions for each form.

The tests were given to two groups of Penn State students – sophomores in a business statistics course and seniors in a DP class. Each student worked each of the problems in a different form so he was exposed to all three media.

The two measures of effectiveness of each of the three versions of each problem were time needed to complete each problem and number of answers correct. The range of time needed by the DP students was smaller than the range for the business statistics students, but – to the surprise of the investigators – mean time to answer the questions was longer for the DP students.

The time studies led the investigators to two "very interesting observations" about unsophisticated users trying to solve relatively simple problems:

- They seemed to be able to finish a problem in "significantly less" time when it is presented in prose rather than flowchart or decision table.
- A problem presented in flowchart form seemed to take less time than one given in decision table form.

Analysis of the answers seemed to show that the range of the number of correct answers is less in the more experienced group of students – that is, the DP-oriented seniors – and that the mean number of correct answers was greater for this same group. Neither finding was surprising, the professors noted.

Even though prose seemed to come through as the best way to present a problem – particularly one in which interpretation by both DP staff and end user is important – Willoughby and Arnold tempered this conclusion.

It may not be valid, they warned, when dealing with a sophisticated end user who has dealt previously with flowcharts and decision tables.

'IRS' Adapted to On-Line Mode

NEW YORK – OS/360 installations using either TSO or Programming Methods' Intercomm as a message-processing facility can support a free-form on-line, interactive version of Inquiry and Reporting System (IRS) from Sigma Data Computing Corp.

IRS is a general-purpose system that allows the user to extract information from as many as 44 input files and to produce a wide variety of output files, in a load-and-go environment. In its previously available batch implementation, it required user specifications to be coded according to special formats.

The on-line version will accept input from a teletypewriter or a 96-character display CRT terminal, and the IRS parameters need not be structured ahead of time. The system converts them to the fixed format required by IRS for execution, a Sigma spokesman explained.

The on-line user may have each parameter checked interactively as it is entered, with immediate correction possible, or he may have an entire set of parameters checked after they are all in the system. The system will not execute if errors are uncorrected.

IRS can be used to create and maintain sequential or indexed sequential files, having fixed-, variable- or undefined-length records on tape or disk. Retrieval logic includes ANDing and ORing, and data can be identified by start position or data name.

Written in Assembler language, the on-line IRS requires a minimum of 50K bytes of core, and is available for $30,000 ($1,000/mo). The batch version costs $20,000 ($650/mo).

The system can be adapted to message-processing facilities other than TSO or Intercomm, with a 90-day delivery and reasonable additional cost, Sigma said from 2 Pennsylvania Plaza, 10001.

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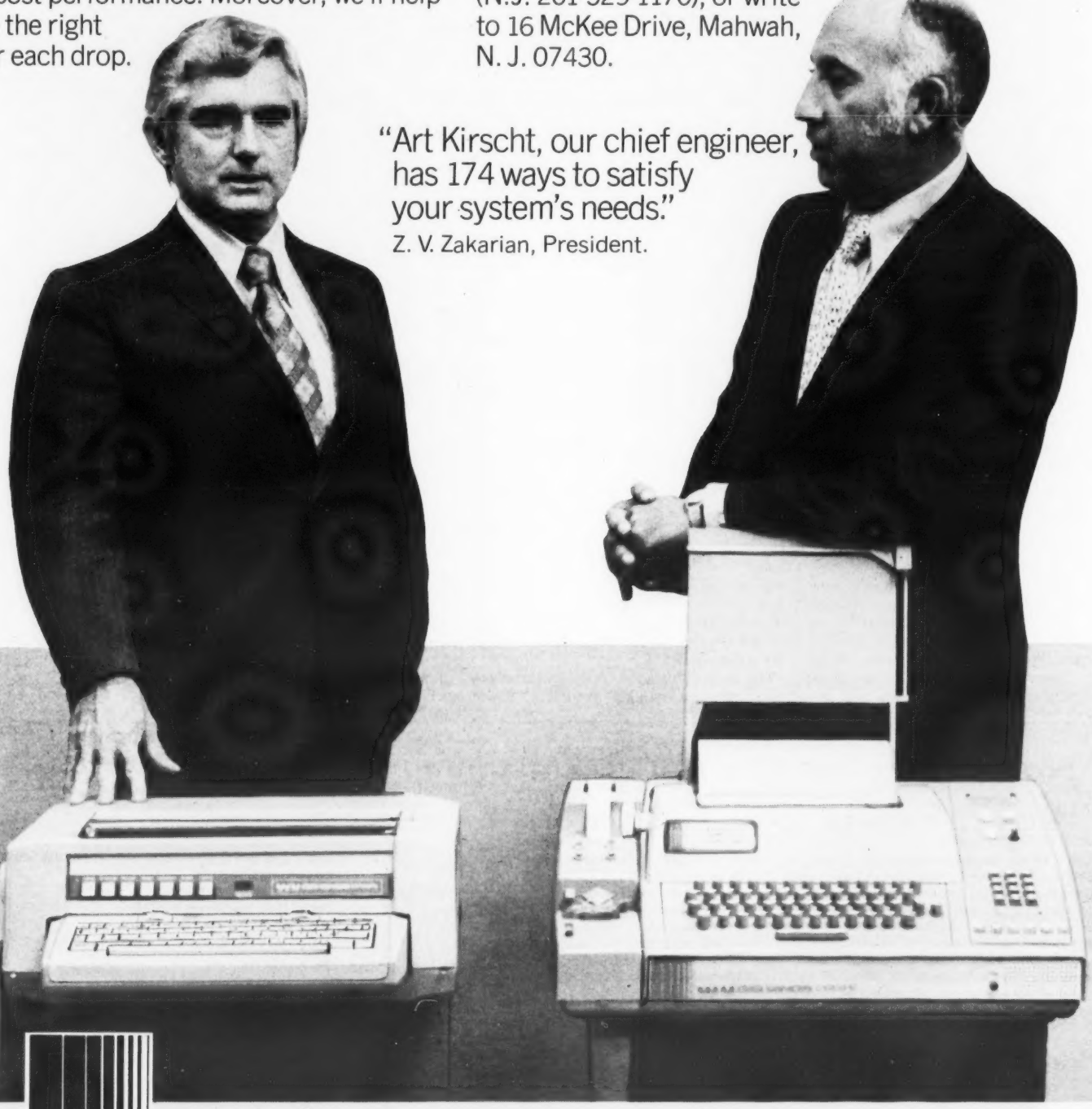

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'CEIS' Handles Business Office And Pupil Records for Schools

By Don Leavitt
Of the CW Staff

SACRAMENTO, Calif. – Large schools or school districts are able to handle both business and pupil accounting with the California Education Information System (CEIS) now being marketed by the state's department of education.

CEIS is made up of two generalized subsystems – for business and for pupils – and each includes a series of application modules. While the system allows each module to be run in stand-alone mode, the real value of CEIS, according to state officials, is that it permits an integrated approach to a school district's administrative problems.

Some of the logic is tied to specific requirements of California law, but the modular design of the system and its low cost ($2,500 for out-of-state agencies) make it a worthwhile acquisition even for those schools and districts that can't use all parts of it directly, a spokesman suggested.

The business subsystem, for example, currently includes four application areas: accounts payable, stores inventory, personnel/payroll and financial reporting and a control system to tie these operations together.

The pupil subsystem also includes a control section, and eight application areas: master file maintenance, attendance accounting, mark reporting, test reporting, California guidance, educational planning, student scheduling and master schedule builder.

The control section in each of the subsystems supports the concept of single entry of data even if it affects more than one application. Under CEIS, each application passes any data it receives to all other applications having need of the same information.

Within each application module, users have a wide variety of report options, except when state or federal law requires a particular form such as tax reporting under payroll. Many of the optional reports are available in two or more different sequences of information.

The system is written in Cobol and has been implemented on IBM and Honeywell equipment, but "should be easily translatable" to other computers as well. It requires a 65K MSR-1 environment on the H-200 line or a 65K DOS configuration on the 360.

The subsystems are available for $1,000 each to California school districts, or $1,500 each to any other users. Together, the subsystems cost $1,500 to California districts and $2,500 to others.

The California Department of Education, Bureau of Information Systems, is at 721 Capitol Mall, 95814.

Novas Gain Batch Mode Under RDOS

SOUTHBORO, Mass. – Nova minicomputer users are able to stack jobs and run in a full batch processing mode by utilizing a system software extension package just introduced by Data General. The Batch software supports both program development and execution of programs in assembly language, Algol, Fortran IV and Data General's new Fortran 5 [CW, Jan. 31].

'Batch' runs under Data General's Real-Time Disk Operating System (RDOS) previously limited to on-line and interactive application support. The new software "clearly makes the Nova more of a general purpose machine," in the opinion of one industry observer.

'Batch' lets the user specify, with a single command, which input and output devices and files will be used by each job. As a related capability, the new software enables the system to accept and run successive jobs from different input devices without operator intervention.

Throughput can be optimized on a 'Batch'-based system, the firm noted, since the output can be spooled to a disk rather than directly to a low speed output device. The data is called off the disk when the device becomes available, without interrupting the application program that generated the output.

Spooling of input from low speed units to disk before being processed was considered but is not in the current implementation of the batch support software. As with developers of spooling packages for full-scale CPUs, the designers apparently felt this capability would not be worth the cost in development time and core required.

The new software can be run alone under RDOS or it can operate in the background of a multiprogrammed RDOS environment.

'Batch' operates on any Nova equipped with a disk, at least 16K words of memory and whatever I/O devices are appropriate to the user's needs.

Freight Costs Added Directly to Invoice With Rate Data Base

ENGLEWOOD CLIFFS, N.J. – Shippers working with almost any type of computing equipment can bill actual freight charges at the same time they invoice for the goods shipped, by using the Prepay and Charge data base service now being offered by Numerax Inc.

The service provides timely motor carrier class rates, applicable to the user's specific products and distribution pattern, for direct input into his billing system. By also adding the weight of each item, the user is able to post the correct freight charges.

The service itself relates freight charges for each product, and the shipper's origin/destination combinations to city zip codes. Numerax provides a magnetic tape that enables the user to match his customers' zip codes to motor carrier rates by product.

Numerax is in continuous contact with motor carrier rate-setting authorities to keep its own master data base on a current basis. Part of the Prepay and Charge service is the distribution of new tapes to the user whenever changes in the rate structure affect his operation.

Separate data bases are developed for each of the user's shipping points since motor carrier charges are often based on start point as well as distance covered and type of product being shipped, Numerax said.

Cost of the data service is dependent on the number of products and the number of origin/destination zip code combinations required by the user.

It might cost a New Jersey firm shipping nationwide $5,000 for set-up and anywhere from $6,500 to $9,800/yr for maintenance, a Numerax source estimated. Numerax is at 560 Sylvan Ave., 07632.

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Data Briefs

Terminal Replaces IBM 2741, Offers APL Graphics Ability

OGDENSBURG, N.Y. – I.P. Sharp Associates has a portable terminal designed as a compatible replacement for the IBM 2741 terminal and which also offers APL graphics capabilities.

The IPSA-100 can communicate with a central CPU via telephone lines or can be attached to any standard TV to display data received.

The unit can be equipped with an APL or Correspondence keyboard and a character generator to provide the 89 APL graphic symbols or the upper- and lowercase Correspondence characters. The unit can be configured with both sets in a switch-selectable arrangement.

The terminal can display either eight or 16 lines of 32 characters.

Prices range from $1,695 to $2,095 depending on the character set and display size required. Delivery is 30 to 60 days from Bridge Administration Bldg., 13669.

Mod/II Replaces Model 33 TTY

SOMERVILLE, Mass. – The NDI Mod/II Teleprinter, from National Data Industries, is designed to replace the Teletype Model 33 which can be used as both a line printer and time-sharing terminal.

The unit has a standard Ascii 64-character keyboard and prints asynchronously at operator-selectable speeds of 10-, 15- and 30 char./sec.

The print carriage is adjustable to accommodate any sprocket-fed paper in widths from 26 char./line to 132 char./line.

The unit uses electronic stepping motors which NDI said increases its reliability. In tests, the Mod/II operated 6,800 con-

The teleprinter costs $3,750 and the numeric pad option is $325. Leasing plans are available from 59 Union Square, 02143.

Bunker Ramo Adds 9-In. CRT

TRUMBULL, Conn. – Bunker Ramo has added a 9-in. screen model to its 2200 Series of CRT terminals.

The BR2204/15 has two independent elements – the keyboard and the display monitor. The 2215 display carries up to 12 lines of 80 characters each and can be mixed with other terminals in the 2200 Series under the Series 2200 terminal control unit.

The 2204 keyboard has alphanumeric keys arranged in standard typewriter format, a 10-key numeric pad, 16 programmable function keys and editing keys.

The unit costs $1,440 or $36/mo. Maintenance is an additional $15/mo. Delivery is three months from the Information Systems Group, 35 Nutmeg Drive, 06609.

Independent Packages Upgrade IBM 3705

By Ronald A. Frank
Of the CW Staff

MANHATTAN BEACH, Calif. – IBM 3705 front-end users now can use independent software packages to obtain capabilities not available with vendor-supplied software.

Comm-Pro Associates has an automatic line speed and system select package, and a code conversion package for operation with 3705s operating in emulation mode.

The auto-speed select package allows use of varying speed terminals operating at 110, 135, 150 and 300 bit/sec on a single interface. This in turn allows a user to reduce the number of modems he has to install. With the IBM 3705 a line interface must be maintained for each speed at which data is transmitted to the front end.

The code conversion package allows the data user to transmit both TTY Ascii and IBM 2741 BCD code to the same line interface. When used in conjunction with the speed select package, the 3705 can support varying speeds and codes.

Both packages can be added to a 3705 emulator program with "minimum modification," according to Comm-Pro. The packages do not affect IBM maintenance because the user can easily load a standard version of the 3705 emulator when IBM performs its maintenance functions, according to Bruce Armor, systems analyst at the University of Southern California DP center.

The university is one of the first prospective users of the 3705 packages and is currently evaluating them. Armor said the software has allowed his site to continue to have the reliability of 3705 hardware and systems support together with the operating enhancements.

The independent software has enabled USC to eliminate about 30 of its low-speed modems and still service varying-speed terminals up to 300 bit/sec, Armor said.

The code conversion package also allows a 3705 user to generate TTY paper tape under TSO while the IBM software does not have this capability, Armor said. At the USC site, the independent software also enables 2741s to operate with either TSO or APL on the same line, he added.

Each 3705 package from Comm-Pro includes full instructions, generation macros and object decks. Storage requirements are 256 bytes for auto-speed select and 768 bytes for the code conversion program.

Comm-Pro is reportedly developing additional 3705 packages that will enhance the network control communications capabilities of 360 and 370 users. This software could be significant for 360 users since most of IBM's latest telecommunications software operates only on 370 virtual storage systems.

The speed select package costs $400 and the code conversion package is $1,000. The company is at 638 14th St., Suite 700, 90266.

Raleigh Aids CEs

On-Line Service Helps IBM TP Users

WHITE PLAINS, N.Y. – Users of IBM teleprocessing (TP) equipment with operating problems often can get assistance from an on-line diagnostic service center available to customer engineers (CEs).

CEs servicing TP equipment anywhere in the country can telephone the teleprocessing test center in Raleigh, N.C. They use on-line diagnostic tests to track down difficulties in terminals and other communications equipment.

Substitute Host

The center provides the CE with remote diagnostic data and verifies equipment operation – usually within minutes – without interrupting the user's DP system. In effect, the teleprocessing test center is a substitute host system for a teleprocessing terminal.

Using the regular telephone network, the CE calls the test center from the user's TP machine. After dialing and signing on with a special number the center's computer runs a general diagnostic test. A specific test tailored to a particular problem also can be requested.

The diagnostics test the user's terminal and control equipment with a series of exercises. The results are sent to the CE for analysis.

From his display terminal, the TP specialist in Raleigh can monitor the diagnostic tests being run by the CE. The specialist can often recognize the difference between a properly operating terminal and one that isn't, by merely listening to the signal.

Besides handling trouble calls, the test center reduces installation time of new TP systems. As each machine arrives at the user's site, CE can install and check whether other parts of the system are installed.

A small portable diagnostic device also allows CEs to test teleprocessing equipment that does not normally attach to the switched network.

This device, the 1,200 bit/sec terminal diagnostic analyzer and tester (1200 TDAT), is especially useful in TP installations using private lines because it makes available the facilities of the Raleigh Test Center.

The TDAT features an acoustic coupler, tape recorder and a modem that allows connection through private telephone lines, from a TP terminal at one location to another at a remote location.

Besides the acoustic coupler feature, the portable testing instrument can:

- Simulate a data set, another TP terminal or even a remote central computer by being able to play recorded data into a terminal.
- Monitor a TP system, and when an error occurs, stop and store data leading up to, and including, the failure for analysis.

By recording data as it is transmitted from or to a terminal, the TDAT verifies transmitted data. The tape recorder also can be used as an exerciser to service a terminal with a malfunction. In this way, a user's central processing unit need not be tied up exercising the terminal.

FCC Reprimands Satellite Firms

CW Washington Bureau

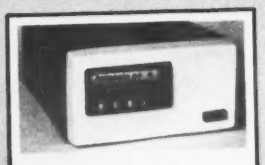
WASHINGTON, D.C. – The Federal Communications Commission has apparently reprimanded the two firms planning to launch domestic satellites next year, for acting too hastily.

The commission has not officially approved the applications of either American Satellite Corp. or Western Union Telegraph Co. to operate such a system, but has waived a section of its rules to allow them to begin procuring satellite equipment for the proposed systems.

However, last week the commission sent identical letters to the firms indicating they "may have entered into contracts for procurement of earth station equipment."

The commission noted it had allowed them under Section 319 of the Communications Act to procure satellite equipment, but it indicated it did not know whether this authority would cover the procurement of equipment for earth stations.

"You are therefore requested to appraise the commission," the identical letters said, whether you have "in fact entered into any contract for procurement of equipment . . . and if so, your views as to the applicability of Section 319."



vadic

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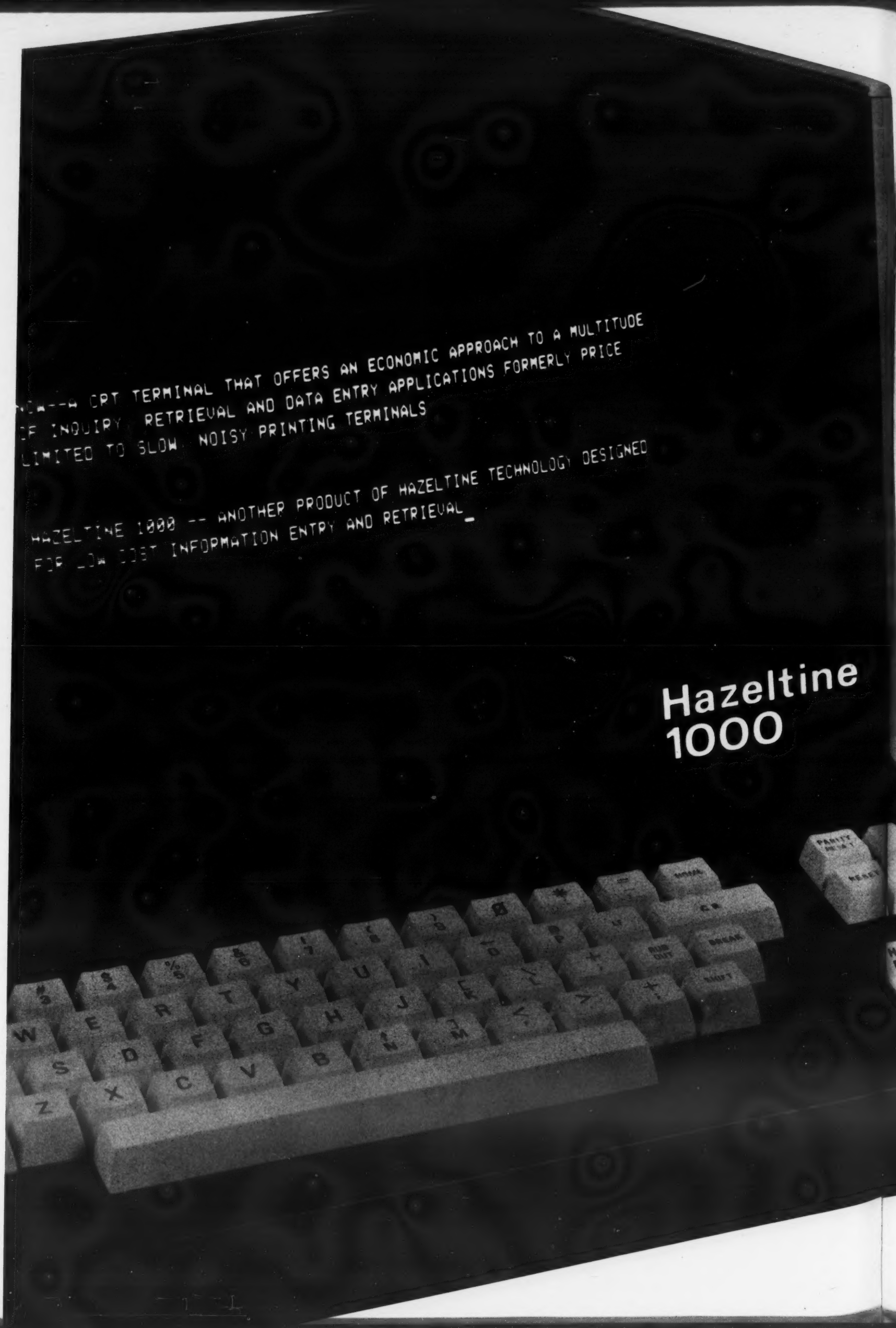
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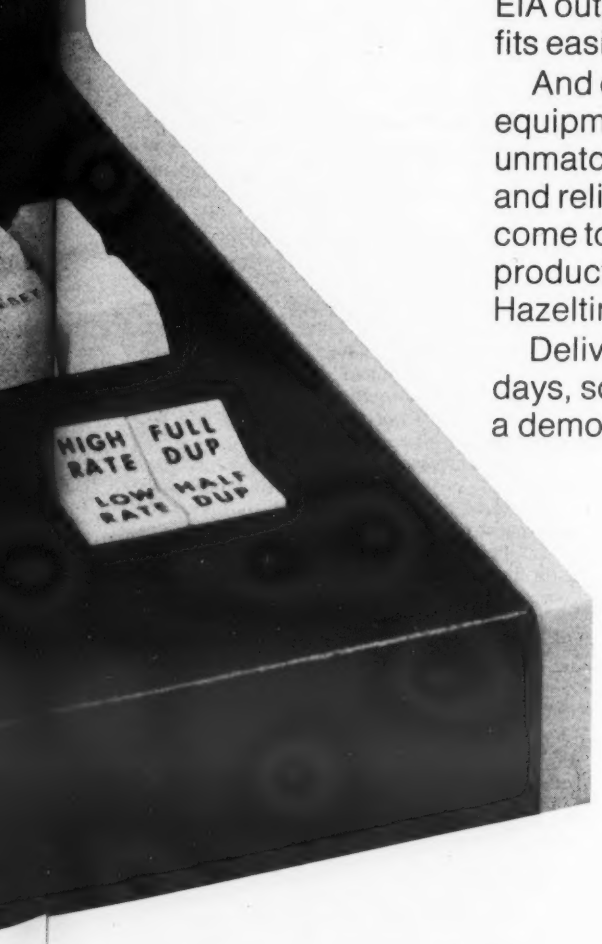

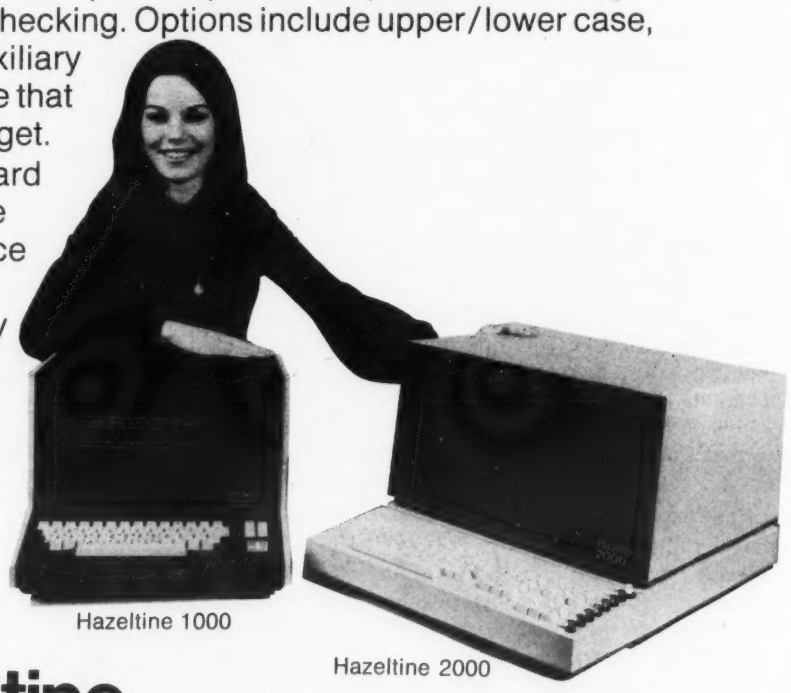

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Entrex 480 Adds Communications

BURLINGTON, Mass. – Users of Entrex System 480 key-to-disk data entry equipment now have the option of system-to-system communications. The added capability makes it possible to send data on one System 480 to another System 480 or to the central computer over leased telephone lines, making possible remotely located key-to-disk stations.

A communications adapter, like any communications controller on a computer system, is the only addition that has to be made.

This adapter makes possible the transmission of data from a remote disk or tape file for writing on a local tape or disk unit or for reception on the printer.

The communications adapter rents for $180/mo on a one-year lease. The monthly maintenance cost is $30. Entrex, Inc. is at 168 Middlesex Tpke., 01803.

Runs on PDP-11

PHI Adds Dual 270X/3705 Software

TEWKSBURY, Mass. – The 370ϕ Telecommunications Processing System, built around a DEC PDP-11 by PHI Computer Services, can be used as either a 270X transmission control unit emulator or a 3705-like front-end, on a program-by-program basis, with the Dual Operation feature recently introduced by PHI.

Another new option, the Multi-Host feature, allows a single 370ϕ equipped with two DEC DX-11b channel interfaces to communicate simultaneously with two 360 or 370 CPUs. This could be used to allow a single terminal to access applications stored on different mainframes, or to allow inter-mainframe communications, a PHI spokesman noted.

The Dual Operation feature is particularly useful, the company said, for installations that require emulation for such IBM Program Products as RJE/Hasp, but want full front-end capabilities for programs that have been written for that mode of operation.

Previously, 370ϕ users have had to choose between the two modes and have the PDP-11 configured accordingly. Now they may utilize Dual Operation to run each program in its best environment, or to keep operations going during a period of conversion from emulation to front-end processing.

A pair of 370ϕs, each having the Multi-Host feature would provide redundancy for communications systems that must remain intact despite failure of any single piece of gear, PHI noted.

The two new options may be used at the same time so that, for example, a single 370ϕ can be linked to two separate mainframes and work with each in front-end or emulation mode, program-by-program, for maximum flexibility.

The Dual Operation software costs $7,500 in addition to the cost of the basic front-end 370ϕ configuration. The Multi-Host feature costs $7,500 and can be used with either the emulation or front-end versions of the 370ϕ. PHI is at 836 North St., 01876.

Bankwire Customers Get Telex/TWX Turnkey Service

MAHWAH, N.J. – A complete turnkey communications system for two banking applications is available from Teleprocessing Industries, a subsidiary of Western Union.

The System 3000 automates bank wire and cable functions as well as money transfer activities. In the wire and cable service the operator-assisted system handles messages from a variety of sources including Fedwire, Bank Wire, Telex and TWX and routes the messages on an age/priority basis automatically through the proper channels. A central processor validates and formats the messages, while keeping a record of all message activities.

Similarly, the money transfer function maintains an on-line account of all interbank and interbranch transactions.

The system is modular and the user can expand it as his needs grow, the firm said. A typical configuration including CPU, disks, tapes, communications interfaces and all the necessary software, ranges from $225,000 to $750,000 depending on the features and the size of the installation. The firm is located at 82 McKee Drive, 07430.

Telephone Line Changes May Require New Data Sets

HOUSTON – The flexibility to change data sets is a must for the communications user, according to attendees at a recent session on equipment selection.

In some cases the changing characteristics of a telephone line can require the user to change data sets in order to get satisfactory results, one user suggested.

At his site, the phone company modified the characteristics of a private line only to have a diagnostic indicator on the data set "flicker continuously" pointing out the line was marginal, he said. A switch to another modem did not clean up the line, but the new equipment was better able to tolerate the degraded line characteristics.

Rental of data sets can often be more desirable than purchases, one user stated. In addition to facilitating a move to different equipment, the leased modem is often accompanied by better vendor support than a purchased device would be, he said.

One suggestion for solving the maintenance problem was made by a user who said he had contracted to have his terminal supplier also maintain his data sets.

This approach can often eliminate fingerpointing when a network fails to operate efficiently, he said.

DP Goes to the Dogs

NEW YORK – Computers are going to the dogs, or at least one is – the one used by the American Kennel Club.

According to AKC DP director David D. Wachsman, the club is presently operating a mix of manual and computer systems, but will soon have everything on its 370/135.

In addition to registering some 1.1 million dogs yearly, and an average of 450,000 litters, the computer is used for statistical analysis of the registration by breed.

This year it is also being used to prepare the AKC's point schedule for dog shows throughout the U.S., an operation which took 35 minutes. Manually, it took 300 manhours.

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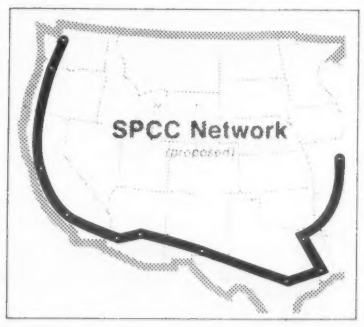

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COMPUTERWORLD

CW SPECIAL REPORT

★ Communications, or Getting It Together ★

Configuring a complicated communications network to meet your particular needs requires extensive and dedicated planning. This special report looks at some users who have met the challenge successfully and presents various alternatives to data users.

Front-End Mini Replaces 270Xs, Saves $250,000

CLEVELAND – A 360-based terminal communications network that uses a minicomputer front-end processor has saved its user $250,000, compared with conventional IBM line controllers.

After an objective equipment search of more than a year, Champion Service Corp. decided the most cost-effective front-end processor was a DEC PDP-11/20 combined with in-house software.

Champion is a DP service company that provides accounting services to more than 35 savings and loan institutions. These S&Ls have an on-line network of 300 terminals that rely on the mini acting as a front end to a 360/30.

Customers in the remote S&L locations present their passbooks for updating of their accounts. The books are inserted into various terminals to post the latest transaction. The terminal mix ranges from IBM to Olivetti and includes terminals that operate at speeds from 134.5- to 1,200 bit/sec, according to John Hall, Champion's president.

"We have an average response time of six seconds," Hall said, "and anything above 10 or 12 seconds is really not acceptable in our industry."

Search for Cost/Efficiency

The on-line terminal system, in operation since 1967, originally used dual 360/30s, twin 2701s and twin 2703 line controllers. But Champion was determined to cut the costs and increase the efficiency of the system.

The result of the equipment study was a switch to the DEC 11D23 front-end processor configuration and a move to a single Model 30 mainframe. "The 2703s were $125,000 each and the 2701s were $50,000 each," Hall said.

"So we are talking about $350,000 worth of equipment that has been replaced by the PDP-11/20 that cost about $100,000." And that does not include the savings from eliminating one of the Model 30s.

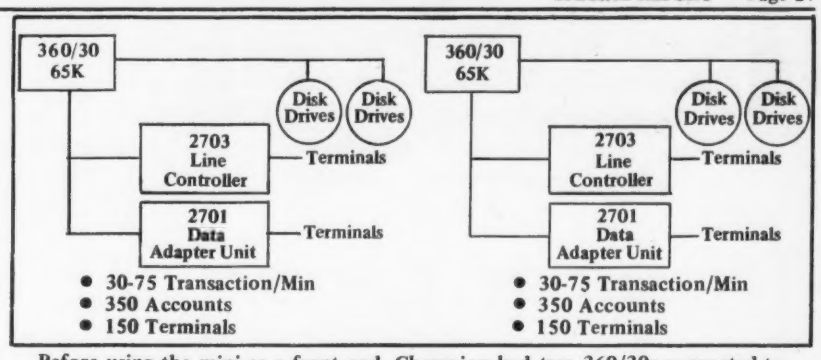
Before deciding on the DEC communications system, Champion considered the IBM 3705 communications processor. But the IBM front end was "not flexible in terms of I/O gear," Hall said. "IBM is always attempting to insure that they are not competing with other equipment in their own line, so they will not allow the user to put different kinds of I/O devices on their 3705s."

But the DEC PDP-11/20 with its DX interface to the 360 (called the 11D23) had the price/performance and flexibility the user was looking for. "There aren't any transmission characteristics we needed that the 11D23 could not support," Hall said.

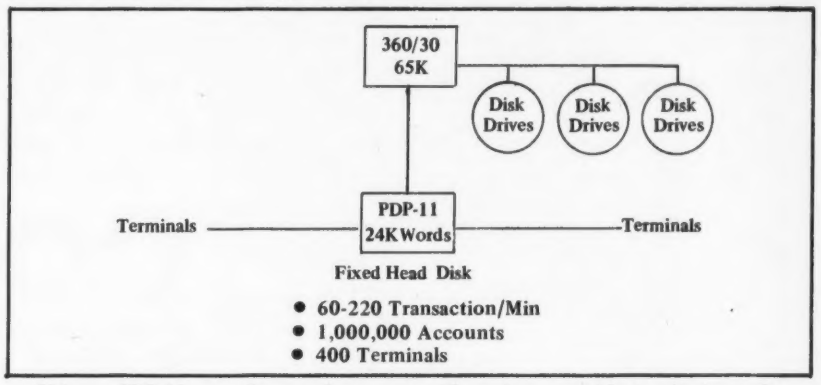
Software Flexibility

Much of the operating flexibility of the system is the result of the specialized S&L package written in-house by Champion. It allows the system to perform "live on-line updating of files."

(Continued on Page 31)



Before using the mini as a front end, Champion had two 360/30s connected to its terminal network through IBM controllers.



Using a PDP-11 as a front-end processor Champion was able to eliminate the controllers for a $250,000 savings.

Two Possible Terminal Nets? Test Both

SAN DIEGO, Calif. – When a company is considering two possible methods for the configuration of a terminal-oriented communications network, the best plan is to test them both.

This dual terminal test approach is being used by the Fotomat Corp. to determine the best communications equipment for its 1,200 photographic stores located around the country.

The goal of the company is to establish a regular reporting system for all its parking lot locations to develop accurate information on sales, inventory and other operating data.

The dual test is unusual in one respect, because the firm is testing an on-line and a partial on-line terminal system concurrently, in two different states.

The on-line test involves 14 Singer MDTS point-of-sale terminals in the Dayton, Ohio area. As each sale is made at a test site, the pertinent data is recorded on a built-in, fixed tape cartridge in the terminal. After the close of business, each terminal is polled from the Fotomat DP center in San Diego where a Burroughs B3500 processes the data.

The average time to transmit the day's receipts from an Ohio store to California is about two and a half minutes, according to Paul Salcido, senior systems analyst. The B3500 is equipped with a Burroughs synchronous line adapter and the mainframe performs the polling routines using a special Cobol teleprocessing package developed in-house.

The MDTS terminals transmit at 1,200 bit/sec in asynchronous mode to the line adapter. Each Dayton test store terminal is equipped with a Bell 202E9 modem which transmits to a similar data set at the DP center.

A Singer transmission adapter converts the data to 2,000 bit/sec synchronous format for entry into the B3500. The terminals transmit Ascii code which is converted into Ebcdic within the mainframe for processing. It takes the CPU about two minutes to process the daily records of each test site.

One of the advantages of the MDTS terminals is their ease of operation, Salcido said. Each key on the terminal is illuminated during its sequence in the data entry cycle, thereby avoiding errors, he said.

"We really don't have a day-to-day picture of what is being sold," Salcido said. If the terminal system develops as planned, each day's transmitted data will give the firm a picture of exactly which products are moving. This in turn will make it possible to print out inventory needs at area warehouses before route workers are dispatched to the stores.

And with closer knowledge of products sold from day-to-day, the company may be able to reduce its warehouse product inventory.

Concurrent with the Ohio on-line test, the company has 13 cash register-type terminals from Victor Comptometer Corp. operating in Ventura County.

The Victor units also accumulate sales data automatically but the information is entered onto removable tape cartridges which are picked up each day by the route man who normally picks up film for developing.

As each route truck returns to the area office, the cartridges are dropped off and merged onto a magnetic tape unit.

The data from the Ventura test sites is then transmitted to the B3500 in San Diego using 2,000 bit/sec Bell 202C data sets. Since the data is already in synchronous format, it does not have to be converted by the line adapter and it is entered directly into the CPU.

This semi-manual system can result in a one-day delay in getting sales data from some test sites but this may be tolerable, Salcido said.

One major objective of both tests is to eliminate as much paperwork as possible at each sales site.

When a nationwide system is configured, the B3500 will probably be able to handle all locations with some additional memory. The system now has 90K of storage in addition to a disk subsystem.

While no final equipment choices have yet been made, Salcido believes that the network will continue to use dial-up Wats lines similar to the polling operation in the Dayton area.

Asked if the concurrent benchmarks from two contending terminal suppliers had led to closer support from the vendors, Salcido said, "we were aware of this factor when we decided to test both systems simultaneously."

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Can Scientific Mini Find Happiness In Business World? 'Decidedly So'

LAKE BLUFF, Ill. – Can a scientifically oriented mini find happiness as the main processor in a business/accounting operation?

Decidedly so, according to the DP staff at ASC Tabulating Corp., which uses a Varian 620/f to handle the administration of pension funds, health and welfare programs, and dues payments for a local labor union.

The 32K mini is located at the ASC DP center about 35 miles from the union offices. Operating on-line with the processor is a mixture of CRTs and TTYs which union personnel use to access member records in response to phone and other inquiries. File updates, data entry and other jobs are initiated at the terminals to modify the data base.

The 620 is equipped with a DCC-2 data communications controller that acts as a line adapter and multiplexer and can handle up to 64 lines, according to Bill Hohri, manager of technical development at ASC. Rather than use the 620 as a front end, ASC interfaced the processor to an IBM 2319-type disk system and a fixed-head drum unit to provide expanded storage capability. The disk is made by Century Data and the drum by Vermont Research but the entire system was supplied and is supported by Varian.

Priority Interrupt

Instead of operating in a polling environment, the terminals access the ASC DP site using an interrupt-driven system. "The hardware grabs a character off the line," and then establishes a priority to complete the particular inquiry, Hohri said.

The system responds on a demand basis and inquiries for the union are run under a roll-in, roll-out partition on the drum. Each partition gets a 100 msec time slice, and the response time to the person at the terminal is usually "less than a second," he said.

At the union office, records are accessed either by a Datapoint 3300 CRT or a Model 37 TTY. The four 3300s operate at 600 bit/sec while the 37s transmit at 150 bit/sec. The office also has one Model 33 TTY which is a reminder of the earlier system when Model 33s and 35s were used to access a GE Datanet 30.

ASC switched to the 620 about 18 months ago, writing all the required software in-house in assembler language. The operating system and about 40 application programs took about "five or six months" to develop, Hohri said.

The terminals transmit to the DP site over Telpak lines using Bell 202 and 103 data sets. And the system including the hardware has been remarkably reliable with better than 99% uptime, Hohri said.

Train Union Personnel

In addition to developing the software and selecting the system, ASC has trained 16 union office personnel to operate the terminals and initiate inquiries to the 620 data base. The system handles all administrative accounting for more than 25,000 members of the Chicago-area local.

Telephone inquiries that need only verbal answers are initiated on the 3330 CRTs, but those that require printed responses must be entered on the Model 37s. The printing speed on the TTYs can be slow, according to Don MacArthur, marketing manager, but there is usually another terminal available for new transactions.

Some of the larger printing jobs can be time-consuming. For example, once a month the 620 prints out 1,600 union welfare checks and a check register, all on the Model 37. In addition dues receipts are printed out in the same manner. All daily file updates are logged on magnetic tape and stored for a specified period by ASC for later reference. But primary control of the system is at the terminals in the union office.

ASC is considering additional unions and other applications for the mini-based system. As a first step, the firm has ordered a larger Varian V73 mini with 64K scheduled for delivery in September. The new configuration will include a DCM communications controller which will allow use of Varian's Vtam communications software, Hohri said.

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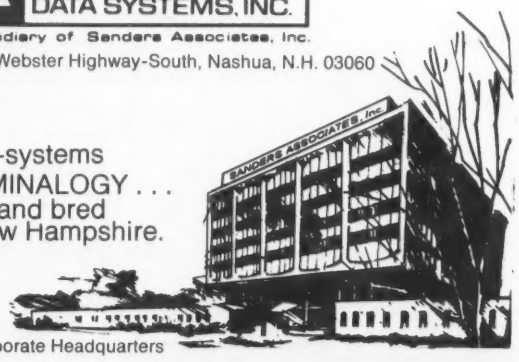

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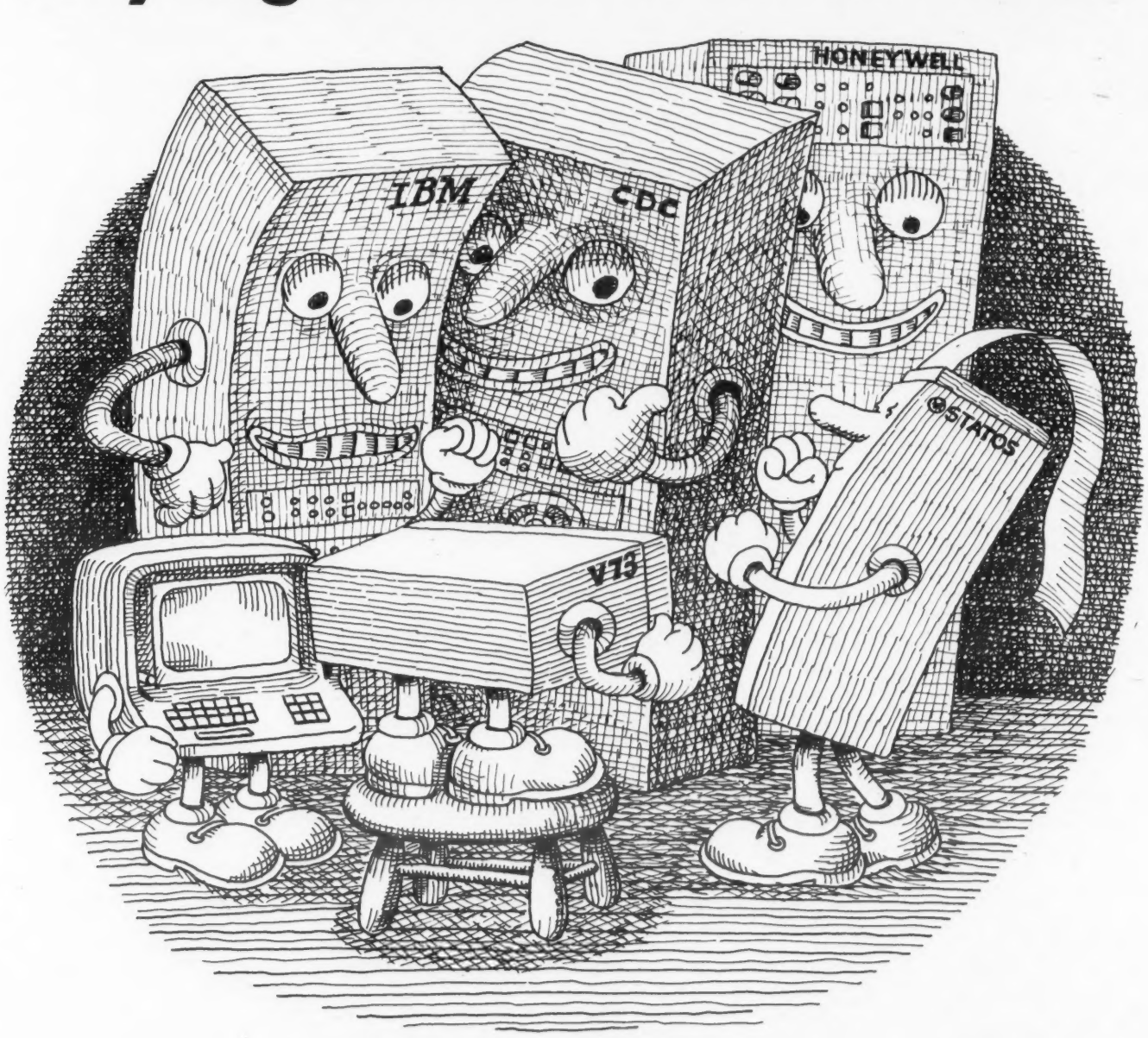

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(Continued from Page 27)

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All totals are also transmitted to the S&Ls once each day. In addition to batched data on the day's transactions, the Champion system provides other administrative information to the remote terminal sites.

The system handles between 60 and 150 transactions in a typical 10-minute period, Hall said. Bell 3002 voice-grade lines are used to reach the central site in Cleveland. "We have a full-time man who takes care of phone line problems with the telephone company," he said.

Individual sites can post transactions manually in cases of a line failure. Then when the phone line again becomes operational, the central files are brought up to date. But despite some outages, the system averages an uptime between 98% and 99%, Hall estimated.

The present system can probably handle another 100 terminals before "it runs out of gas," Hall said. After that a second 360/30 would give the system additional expansion capability.

The possibilities of having dual 360s running on the 11D23 are now being discussed with DEC, and a second front end could also be added later.

The Champion software package is available to other service firms or direct to S&Ls for operation of an in-house system. The package would work with a 360 and a 270X front end, Hall said. "But if a user wanted to receive our future software updates, he should have the 11D23 front end," he said.

Asked if there were any disadvantages with the DEC system, Hall said he had some doubts about the firm's ability to provide adequate maintenance in the field. But so far there have been few problems. "I talked with other DEC users who said the equipment seldom needed servicing. But the company was ready to provide support when needed," he said.

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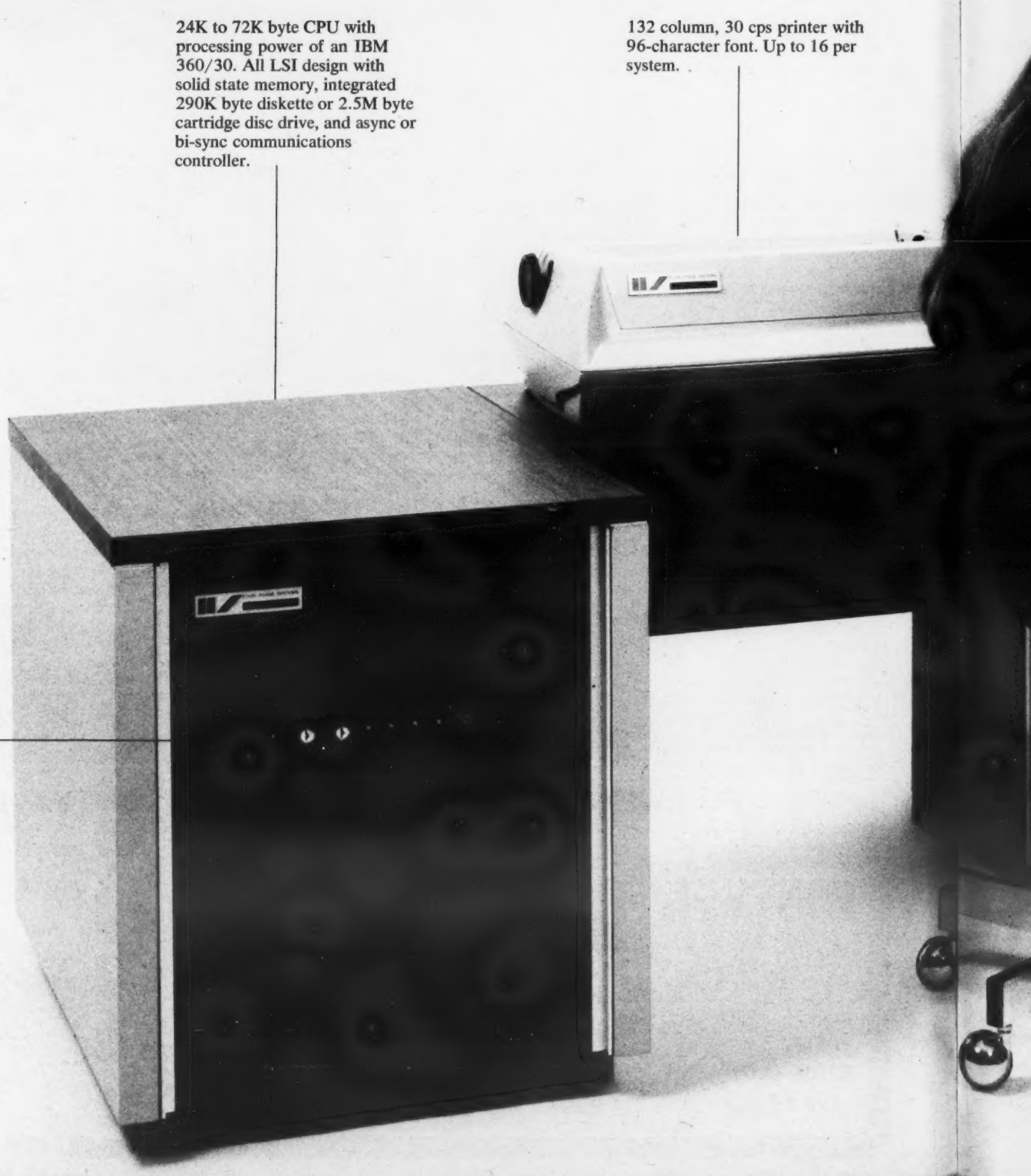

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Third National Network A Viable Alternative?

As the specialized carriers move closer to providing full-time service to data users, a third national carrier net in addition to MCI and Datran may be forming.

For data users operating national networks this would eliminate the difficulties in choosing different specialized carriers for service in specific geographic areas.

While MCI and Datran are planning their own coast-to-coast systems, the third national network reportedly in the making would interconnect the remaining regional carriers.

Few of the regional carriers that would make up this network would comment on the plan, but some interesting facts are known. A tentative specialized carrier association to represent the members in regulatory proceedings has been discussed. While outwardly the organization would act as a spokesman for all specialized carriers, Datran and MCI have thus far apparently not participated.

The remaining five carriers could interconnect their respective areas with limited duplication of facilities, although there would be some problems in specific states such as Texas.

Who Are the Carriers?

Southern Pacific Communications Co., San Francisco, already has much of its system in place based on the railroad microwave system operated by its parent company. The firm expects to provide both individual channels and turnkey facilities including modems and terminals depending on the users' needs.

Customers will be able to order anything from a single narrowband circuit up to a 240-channel supergroup. A 300 bit/sec service will cost about $.36/mile for the first 500 miles and $.28/mile thereafter. At 1,200 bit/sec, users would pay a flat $.80/mile.

The company will provide service from Seattle down the West Coast. From San Diego it will swing east into Texas and up to St. Louis. Although rates have not yet been filed, prospective users are being quoted a range of rates from $.95/mile/mo for a single 4KC circuit up to $24/mile/mo at a site with 60 channels of the same bandwidth. This compares with Bell's Telpak rates of $30/mile/mo on 60 channels.

CPI Telecommunications Inc., Austin, Texas, plans to offer facilities to data users in Texas and Louisiana. The firm also handles CATV and video distribution so in most cases existing routes would be "overbuilt" to add the data capability. CPI could connect with Southern Pacific at El Paso and carry data transmissions east to New Orleans. The firm reportedly plans to begin service to data customers late this year.

Many of the Texas cities CPI plans to service will duplicate locations where Southern Pacific and others propose to operate.

More Texas Links

Another specialized carrier with links in Texas is United Video Inc. of Tulsa, Okla. The company describes itself as a southeast regional carrier and its routes will stretch from Texas through Atlanta to Miami. Service would also be provided north from Atlanta to Washington, D.C., and from Atlanta north to Minneapolis.

The first data customers in the United Video net will get service later this year between Dallas and St. Louis at rates "30% below the projected AT&T high/low density tariff." Compared with existing AT&T interstate charges, the specialized carrier expects to be about "50%

(Continued on Page 35)

Specialized Carriers Go Their Special Ways

MCI and Datran are two specialized common carriers which plan to provide coast-to-coast service with their own nets, and their progress to date is almost as divergent as their proposed systems.

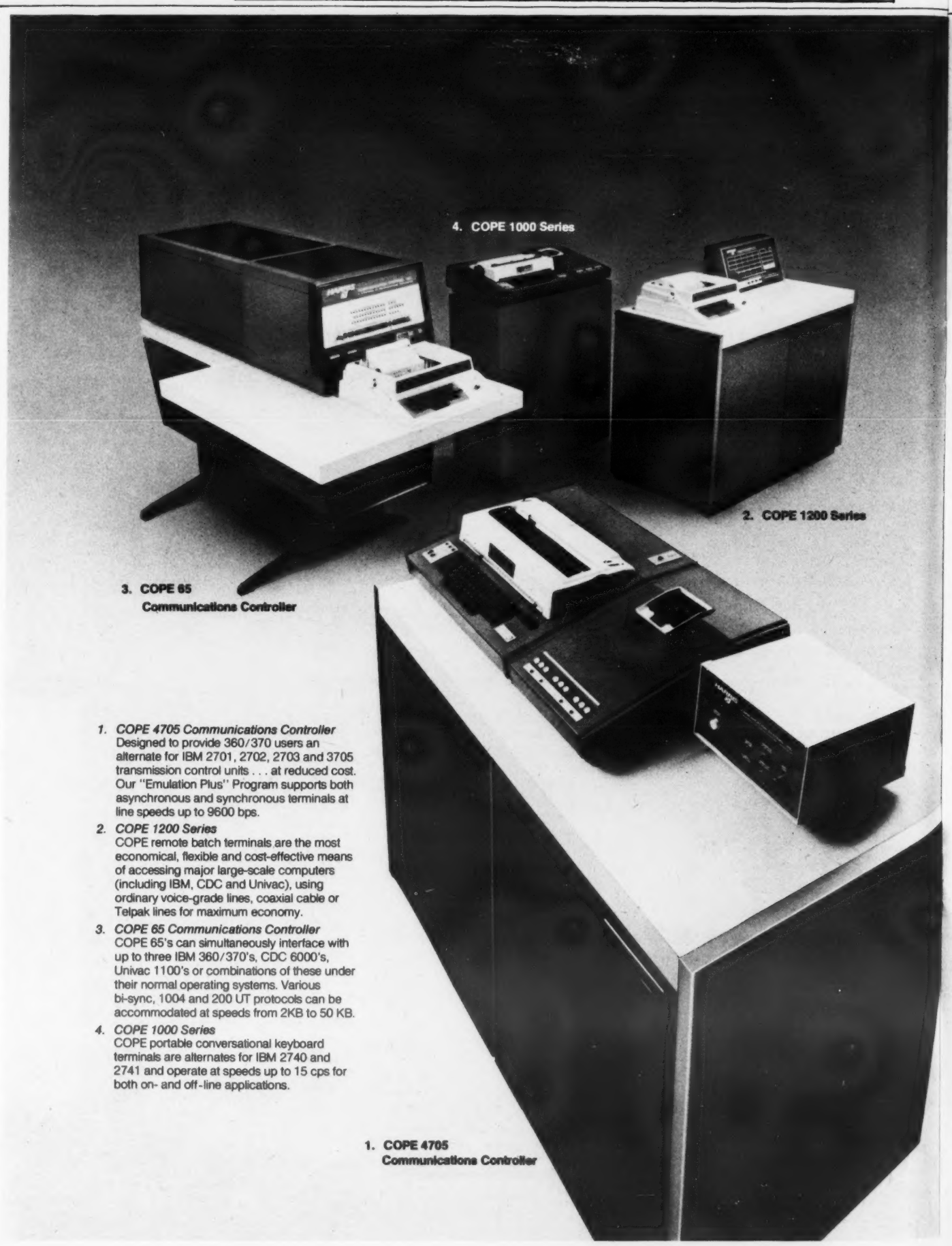
MCI has been building its Chicago-to-New York route for some months. It expects to provide service between Chicago and some of the intermediate stops along this route such as Toledo or Detroit, by the end of this year.

The company has received FCC approval for 270 microwave sites that will link 42 major metropolitan areas and has announced the 4K Plus service for data and other users. This offering includes five speeds ranging from 300 to 9,600 bit/sec that will save users from 28% to 44% over Bell rates, depending on speeds. At 2,400 bit/sec, the savings could be as much as 40% under Bell private line charges, MCI said.

In contrast to other specialized carriers, Datran has had little to say about its rates. Officially it has said it will be in service from Houston to St. Louis by the end of 1973. But it has said prices will not be available at least until September.

At the same time, the carrier has admitted it is talking to potential users about providing services and presumably these users are being quoted rates. At a recent communications show, Datran spokesmen were quoting "typical" 4,800 bit/sec rates at $10/hr for dial-up service, which reportedly can be split into six-second usage increments. This would set the rate at $1 for each six seconds of contention-type service on the proposed system.

Private line users who need dedicated facilities were being quoted monthly rates of $0.90/mile. The Datran service reportedly will guarantee a 500 msec (or less) connect time for data users.



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How to Transmit? Phone Company Has Ideas, but...

By Arthur L. Katz
Special to Computerworld

Because many decisions must be made by data users, it is often left to the local telephone company to suggest the most economical approach to data transmission over voice-grade facilities that will fulfill the transmission objectives. And the telephone company will suggest what it considers to be the best solution, whether it be WATS, toll, tie lines, etc.

In the majority of instances the telephone company recommendations are accepted with very little challenge by the user.

The telephone companies, however, make broad assumptions when planning facilities. One assumption is that the busiest hour of the day represents 17-1/2% of the total day's traffic, which they say is the national average.

While 17-1/2% may be a national average it may not be the actual busy condition for the user's firm, and if not, then the telephone company's recommendation would be erroneous.

Assumptions Faulty

The interconnection of dialed number printout machines that electronically capture concurrent statistics on all long distance transmission facilities (WATS, tie lines, tolls, etc.) have shown that many assumptions about traffic flow are incorrect. For example, very few studies of individual firms disclose the figure of 17-1/2% for the busy hour.

Since an unbalanced configuration of long distance services would result in higher than necessary charges, here are the basic statistics users should assemble before any decisions are made:

- Destination of call (Area Code and number for dialed calls; digits dialed for tie lines or networks)
- Date of call
- Time of day call was made
- Length of call in minutes and fractions of a minute
- Facility used (toll, WATS, private or tie line, foreign exchange, etc.)

When these statistics are organized, the options regarding the available facilities become apparent.

The user who can develop these statistics in-house is in a much stronger position to confirm or deny the accuracy of the phone company's recommendations, or make his own recommendations. There are also firms that can prepare this information for the user.

Any recommendation from the telephone company must be supported not only by the statistical base, but also by the guidelines of how the statistics were used to determine the recommended lines.

A network configuration variance of only 15% plus or minus can cost as much as 50% more in long distance costs to the customer. So the optimum configuration should be installed, and periodic checks should be made to make adjustments when necessary.

Arthur L. Katz is general manager of Computoll Inc., New York, N.Y.

Third Network An Alternative?

(Continued from Page 34)

less."

United could tie into the potential national network in Texas, or at points in the Midwest with another regional carrier, Western Telecommunications Inc. (WTCI).

Denver-based WTCI gets considerable revenue from long-haul video transmissions for the major TV nets. The firm already is providing a high-speed data link for a military application between San Diego and Yuma, Ariz. [CW, March 7]. In addition to the West Coast, WTCI plans to provide service to the Midwest, possibly connecting with other carriers somewhere east of Denver.

WTCI has over 13,000 miles of microwave routes in operation and much of this could be converted to service data users.

The carrier that plans to operate primarily through the center of the country is Nebraska Consolidated Communications Corp., Lincoln, Neb. Planned routes include service from Minneapolis to Texas with a major east-west segment from Chicago to Omaha. It could interconnect with a national net at most points in its proposed system.

Questions to Resolve

While the geographic factors may favor a tie-in between these smaller specialized carriers, there would be important marketing and technical questions to resolve. Each would have to build its facilities with a view toward being compatible with the others. And several firms serving the same state (and even the same city) might not be completely desirable.

Presumably some cities would be dropped, or conceded to others if a viable net is to be interconnected. For example, all the firms except WTCI plan to service Dallas. And with Datran and MCI also committed to the city, as well as the existing carriers, there may not be enough data users to go around.

From the users' standpoint, an overabundance of carrier facilities may offer competitive prices, but there would also be some risk in signing up with a carrier that may not survive. It is for this reason that an association and a possible third national network could offer data customers a viable alternative.

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An Analysis

New AT&T Rates Could Change Network Designs

If AT&T's proposed private line rate changes [CW, March 7] are approved by the FCC, users will have to drastically alter their network design methods. Although opposition to the tariffs and regulatory delay could forestall the revised rates from taking effect, data users should understand the potential impact on their networks.

Under existing FCC Tariff 260, which covers voice-grade private lines, it has been possible for the user to design his communications routes in such a way that he optimizes his monthly line charges.

With the present method, users can plan their networks based on determining the optimum points for network nodes, concentrators, multiplexers, etc.

Many software design packages are available to help the user configure his network. Most are based on a coordinate system developed by Bell which establishes V and H coordinates through all rate centers within the U.S. phone system. The V and H system is similar to the X and Y coordinates used to plot graphics. The software design packages optimize network routes based on the V and H coordinates and the "long haul" phone rates that are applicable.

But AT&T proposes to change the ball game and utilize a dual rate structure based on high density and low density centers, which could obsolete many of the design packages.

Under the existing rate structure, monthly charges are based on a sliding scale which depends on the total mileage. For example, "interexchange rates" are $3/mile for the first 25 miles, $2.10/mile for the next 75 miles, $1.50/mile for the next 150 miles, etc.

Most vendors who have network design packages guard their methodology carefully. They are quick to point out the potential savings that can accrue to the user if he works with their network planning capabilities. One vendor claims a line savings of $100,000/yr for one large customer. This was reportedly achieved by introducing multiplexers into the network.

The network-planning capabilities are available in several forms for the user. They range from packages offered on an interactive basis on time-sharing services to full-blown systems design studies.

A representative (but by no means complete) sample includes APL Plus Net available from Scientific Time Sharing. A user utilizing the package on a time-sharing basis could configure a 30-city network for "about $10," a spokesman estimated. The package is written in APL and the calculations involved in configuring the system determine the minimum network distance. This is a matrix-oriented problem which works well with APL, he said.

Another approach is used by Computoll Inc. The firm concentrates on examining existing telecommunications systems to find ways the user can cut costs. Often this will include monitoring the data traffic to determine where less costly lines can be obtained by the phone subscriber.

Almost all of the network planning packages and/or services use computerized analyses to recommend less costly operating methods to the user. Even IBM has several packages which are officially described as "marketing support" tools.

One of the earliest IBM packages was the Communications Network Design Program (CNDP). Although once available on a fee basis to users, IBM now uses it only to help salesmen who are making systems proposals to teleprocessing-oriented prospective customers.

A similar package, which may have re-

(Continued on Page 39)

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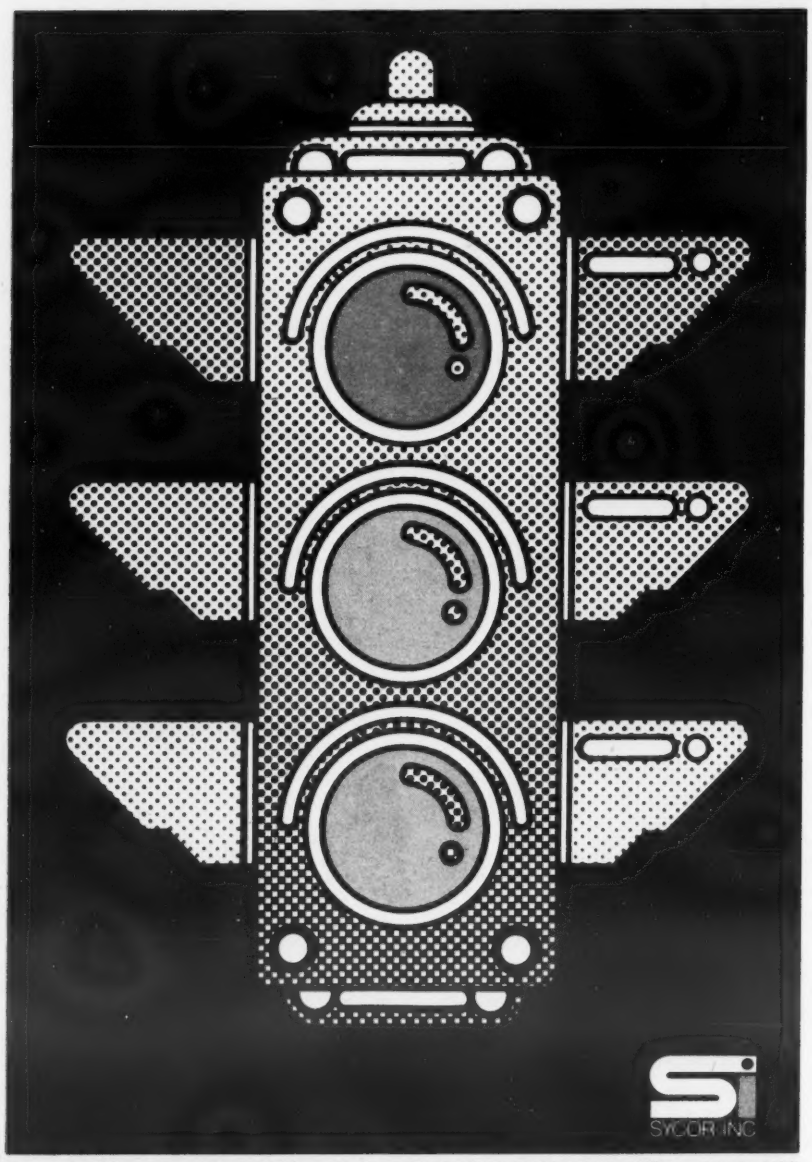

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'Hi-D Lo-D Optimizer' Handles Proposed And Present Rates

ANN ARBOR, Mich. – One of the first firms to introduce a network design program geared for the newly proposed AT&T tariffs is DMW Telecommunications Corp.

The Hi-D Lo-D network optimizer program is a batch-oriented system. It contains "prestored V and H coordinates" for all high density rate centers and will run on any mainframe which supports standard Fortran IV, the company said.

The program evaluates direct routing and all necessary indirect routings through nearby high density centers which might be less costly than direct routing. For each input card containing V and H coordinates for "arbitrary locations," the program generates an output including total cost and routing rate centers for the minimum cost billing configuration.

Costs under the current AT&T rate structure are also available. An interactive version of the system will be available soon, the firm said.

One of the problems handled by the program is the Bell proposal that all low density (higher cost) centers be routed to specified high density "homing centers." This plan (if approved by the FCC) would limit the design flexibility that users have to configure a network.

The DMW program, designed by Dixon Doll and Kevin Whitney, will allow for network configurations with or without the homing center restrictions depending on the rate structure ultimately approved by the FCC.

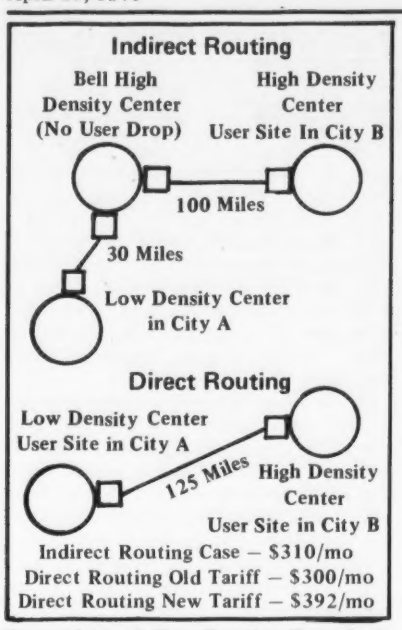
Although the high and low density designations seem confusing to some users, they have a logical explanation.

The Bell System has always had a hierarchy of long distance telephone centers based on the number of circuits being handled at each center. According to this hierarchy, Bell has taken the regional and sectional centers and classified them as high density. Bell defines these centers as those having the facilities to terminate 1,200 or more L-carrier transmission routes.

But within this definition, it comes as no surprise to industry experts that these lower-cost locations also coincide with the cities where most of the specialized carriers expect to compete with Bell.

The rest of the centers in the Bell hierarchy including primary centers, toll centers and end offices are apparently designated as low density sites under the proposed tariff revisions.

DMW Telecommunications Corp. is at 2975 Hickory Lane, 48104.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Direct Routing New Tariff – $392/mo

Comparison of Two Routing Procedures Between a Low-Density Center and a High-Density Center

New Rates May Alter Net Design

(Continued from Page 38)

placed CNDP, is called TP Net. It is also available only in marketing situations and IBM spokesmen said additional details on both packages are unavailable.

Complex Undertaking

The theoretical problems presented by the design of a telecommunications network is a complex undertaking even for skilled mathematicians. Despite IBM's silence on the packages, a recently published article demonstrates the complexity of CNDP:

"The package accepts input data in the form of tariff information, terminal and computer locations, terminal traffic volume, and line loading or response needs. The IBM technique assumes that a star network of point-to-point links from every remote terminal to one of the central [CPU] complexes is the most costly (worst case) layout.

"In successive iterations, it removes a link that attaches to one of the centers, and replaces it with some other shorter link to reduce line costs by the formation of multipoint lines. At each iteration the method selects a particular pair of links (one to be removed and the other added) to produce the greatest net reduction in link cost without violating line traffic constraints.

"Although this method takes care of traffic overloads, it assumes the placement of concentrators and disregards the use of mixed grades of service in the same network."

But many network design experts believe CNDP and similar packages will become obsolete if the high and low density rates are approved. The IBM package can only evaluate networks in which links terminate in cities where there are actual drops (terminals).

But the new high/low rates allow the user to design a network in which it may be more economical to route circuits indirectly through centers where he does not actually have terminals. CNDP and most existing design programs don't allow for this, the experts say.

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Exchanging Ideas, Solutions

Education Prime Goal

TP Associations Expanding to Meet Managers' Needs

By Jerry A. Goldstone
Special to Computerworld

The telecommunications association was born because of the need of managers in the field to exchange information and experiences. Association members are responsible for administering communications facilities and services in the hundreds of millions of dollars and with telecommunications becoming increasingly complex, these association have grown extensively.

In terms of geography, there are two types of telecommunications associations: national (or international) and regional. Of the national associations, the International Communications Association (ICA) is the largest with members in 34 states as well as Canada and Venezuela.

Other national associations are the Communications Systems Management Association (CSMA) and the Association of College and University Telecommunications Administrators (Acuta).

Most telecommunications associations, however, are regional in scope. The largest regional group is the Tele-Communications Association (TCA), which is located primarily on the West Coast.

Another way to classify associations is by the members: general industrial and commercial companies or specialized companies. ICA, CSMA and most of the regional associations are general in that they have members from many different industries. On the other hand, Acuta is an example of a specialized group.

No matter which category a group is in, most of the associations have two common characteristics: they are composed entirely of end users (specifically excluding suppliers and consultants), and they have company rather than individual memberships. The only exceptions to these rules are CSMA, which allows suppliers to become members and has both company and individual memberships, and Acuta, which has individual rather than university memberships.

Typical Members

The company members are generally large companies or institutions with substantial communications facilities. They are often multiplant operations with many private lines or even a complete private telecommunications network.

The representatives of the member companies are responsible for managing their companies' telecommunications facilities. They may do this full-time or part-time. (Most associations require that the voting member from a company spend at least half of his time on telecommunications activities.)

The background of a member very often includes experience in a telephone company, particularly a Bell System company, but there are some who have come up through various departments in their present organization and who have no common carrier experience.

The purpose of most telecommunications associations is education. This is understandable since until recently there were virtually no formal educational programs in telecommunications management and no comprehensive sources of information on the subject. Telecommunications managers have found that by getting together and sharing experiences, they can keep better informed.

No Lobbying

One activity that almost every association explicitly prohibits is regulatory lobbying. Most have the prohibition written into their bylaws. Most associations feel that member companies' interests are too varied to make a common position possible.

This rational seems rather dubious, particularly when it comes to testifying before regulatory bodies on tariff matters. Certainly companies with extensive (and similar) telecommunications facilities would have a common interest in most tariff filings. And most commissions would be glad to get the user's viewpoint.

The real reason for the prohibition against lobbying is more complex, and probably involves the role of telecommunications management in a company and the pervasive influence of the telephone companies, particularly AT&T, in American industry.

But the telecommunications associations may become more active in this area in the future. At least two major groups have discussed the possibility of testifying before regulatory commissions. While both rejected the idea for now, they believed it necessary to discuss and re-evaluate their positions. In addition, many individual members and small groups of members do testify before commissions and are becoming more active.

Relationship with Carriers

The relationship between the common carriers and the associations is interesting and complicated. It seems to be a kind of love-hate relationship. On the one hand, most groups bar suppliers from membership so they can frankly discuss problems they have with the carriers.

On the other hand, the carriers' services are the central element of most members' jobs. The members deal with the carriers almost on a daily basis and have developed a close relationship. In a real sense, the carrier helps the telecommunications manager do his job.

This relationship carries over into association activities. Many regional groups devote at least one meeting a year entirely to the local telephone company and another to Western Union and perhaps a

(Continued on Page 41)

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- ICA -- for $1 Million Installations
- CSMA -- 'Furthering Professionalism'
- Acuta -- for the University Set
- TCA -- Centered on West Coast

While telecommunications associations have many common characteristics, there are also some important differences.

The International Communications Association (ICA) is the oldest and the largest of the associations. It was founded in 1948, and today has over 300 company members represented by more than 700 individual members (voting and alternate).

To become a member of ICA, a company must be an end user and must spend at least $1 million a year for telecommunications services and facilities.

ICA publishes a monthly newsletter and holds an annual conference. The group also sponsors occasional seminars.

CSMA Unique

The Communications Systems Management Association (CSMA) is a new organization formed in 1970 by a group of graduates of the now-defunct AT&T communications school at Cooperstown, N.Y. The organization is rather unique in at least three respects: it allows suppliers to become members; it has both company and individual memberships; and it is managed by a full-time staff.

Although founded in 1970, CSMA did not really get off the ground until early 1972. Today, it has about 300 members (mostly individual) and local chapters in New York, Philadelphia and Baltimore, with one soon to be formed in Chicago. It hopes eventually to be nationwide.

The organization has some lofty goals. Its primary purpose is "to further professionalism in the communications industry." It hopes to accomplish this through programs in three areas: information interchange, professional certification and public relations.

The Association of College and University Telecommunications Administrators (Acuta) is just over a year old, having had its first organizational meeting in November 1971. The reason for this specialized group is that educational institutions have many unique communications problems. Some of these problems are administrative caused by the inability to communicate with faculty department heads, frequent service connections and disconnections, a serious problem with toll fraud among students and a wide variety of facilities and systems.

Unlike most other groups, Acuta explicitly plans to conduct lobbying activities. One reason it can do this easily is that the organization is composed of individuals – the schools themselves are not members and Acuta does not speak for them.

The organization appears to be interested in promoting special lower telephone rates for non-profit educational institutions.

TCA Expanding

The Tele-Communications Association (TCA), the largest of the regional organizations, was founded in Los Angeles by five members in 1961. It expanded to other cities in California in 1964 and today, while still primarily centered in California, it has a handful of members in Washington, Oregon, Idaho, Illinois and Pennsylvania. Its current membership is 126 companies.

To become a member of TCA, a company must have multiple offices connected by telecommunications circuits and not be engaged predominantly in the consultation, administration, production, sale or rental of telecommunications services.

TCA holds an annual conference each year in San Diego, and publishes a monthly newsletter. The organization also has sponsored an evening course in communications management at the California State University, Northridge, and expects to establish similar courses in the San Francisco and San Diego areas.

Other regional groups include the Chicago Industrial Communications Association, the Michigan-Ohio Telecommunications Association, the Communications Managers Association of New York, the Wall Street Communications Association, the New England Telecommunications Association, the New England Hospital Telecommunications Association and the Arizona Telecommunications Association.

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Societies Expanding To Meet User Needs

(Continued from Page 40)

third to an international carrier. And these meetings are often held at the carriers' facilities. Of the 19 seminars and presentations at last year's ICA Annual Conference, 12 involved carriers (including MCI and Datran).

Equipment vendors have nowhere near the same amount of influence. Only one presentation at the ICA conference involved a vendor. The reason is clear: no matter how much a telecommunications manager might complain about telephone and telegraph services, the carriers are just about the most important element in his professional life.

The direction and programs of the associations may change in the future with more emphasis on in-depth educational activities. The complexity of telecommunications will demand such a change. Several associations are already sponsoring seminars and formal courses and lending support to an advanced university degree program. This trend should continue as telecommunications becomes less of a technician's function and more of a profession.

Jerry A. Goldstone is the editor and publisher of Business Communications Review, in Oak Brook, Ill., a bimonthly journal for telecommunications managers.

About the Author

This special report was prepared by CW Technical News Editor Ronald A. Frank. Frank has been responsible for the communications section since 1969.

Dual 165s Receive Data

Fireman's Fund Finds 'No Fault' With On-Line Net

SAN FRANCISCO – One of the primary reasons for establishing a computer/communications network is to provide on-line reporting of important data. For a large insurance company such as Fireman's Fund, the activities of branch offices around the country produce a steady stream of information that must be reported to the DP center in San Francisco.

The main DP capability for the company rests with dual 370/165s that receive data from six satellite processing centers strategically located around the country.

The satellite centers receive data from smaller offices in their geographic areas and transmit this information over 4,800 bit/sec lines to the 165s.

Incoming data is received by an IBM 3705 equipped with a 2914 switch. The 2914 is attached to the multiplexer channel on each 165 and allows the DP center to connect the front end to whichever CPU is available to accept data from the field. The 3705 cannot serve two CPUs simultaneously.

The 4,800 bit/sec lines are equipped with Paradyne M48 modems which include built-in diagnostics to help isolate problems, according to Ray Schwarz, telecommunication analyst. The diagnostics allow Fireman's to provide AT&T Long Lines with valuable operating data when lines go down, Schwartz said.

Variety of CPUs

The six regional processing centers have a variety of IBM CPUs which are integrated into the company's network. Included are 1130s, 360/25s and a 360/20. Each satellite CPU handles administrative and other jobs for local centers as well as operating on-line in a Hasp environment with the 165s.

Each regional center used to keypunch transactions received from branch offices, but with thousands of transactions to be processed daily, a faster method had to be implemented, Schwarz explained. To speed the process, each regional center installed Four-Phase CRTs controlled by a mini and each mini was connected directly to the main DP center so that both the CRT entry systems and the satellite processors could transmit data on-line to San Francisco.

The 4,800 bit/sec lines are 3002 series from AT&T with C2 conditioning. This network configuration will be improved with a dedicated Common Control Switching Arrangement (CCSA) from Bell later this year, Schwarz said.

The CCSA configuration will be the backbone of an integrated national network being configured by Fireman's parent company, American Express. To be called A-Com, for American Express Communications Network, the new system will provide communications services for all American Express divisions.

The total American Express telecommunications network will be one of the largest communications systems ever integrated within one company, according to Ben Bevis, manager of Fireman's technical services division.

Because of the national network goals spelled out by its parent company, Fireman's has expanded its own computer/communications capability with an eye toward later integration into the total corporate network, Bevis said.

Although the American Express net will be totally integrated into one network, each subsidiary will operate functionally discrete operations designed to its particular applications, he added.

Meanwhile, Back Home

But for the present, the Fireman's teleprocessing staff is concerned with solving immediate requirements. At its home office in San Francisco, the company uses 39 2260-type CRTs from Trivex Inc. Most of these operate under IBM's TSO to communicate data to the 165s. The remainder are used for operational systems and in-house monitoring, Schwarz said.

The Trivex displays are spread around the campus-like office complex and transmit their information over hardwired lines into a 2848-type controller installed at the DP center.

At present, the individual branch offices send their data manually to the regional centers. One proposed upgrade now being considered is the installation of buffered 2740-type terminals that would allow each office to capture data using key-entry onto tape cassettes, Bevis said.

The Fireman's communications network has evolved over a period of six years. Some of the outlying Fireman's centers use earlier systems compared with the 165s. As an example, the Newark, N.J., regional center still runs some 1401 emulation software on its 360/25.

Major Upgrade

One of the major upgrades being planned by the firm is a conversion from the 165s to 168s. And when the corporate network becomes fully operational, the company may save up to $2 million/yr, Bevis estimated. This is based on a projection of 26 million calls coming into the regional centers by 1977.

As the system grows each regional center's processing functions would be displaced by branch offices connected to a store-and-forward concentrator. Fireman's goal is to have most transactions reported on-line to its central DP center, and according to Bevis this capability should be available within the next three years.

CW Photo by Ronald A. Frank

Ray Schwarz, telecommunications analyst at Fireman's Fund, points out capabilities of the IBM 3705 as Ken Watts, telecommunications manager, watches.

Wiltek data communi
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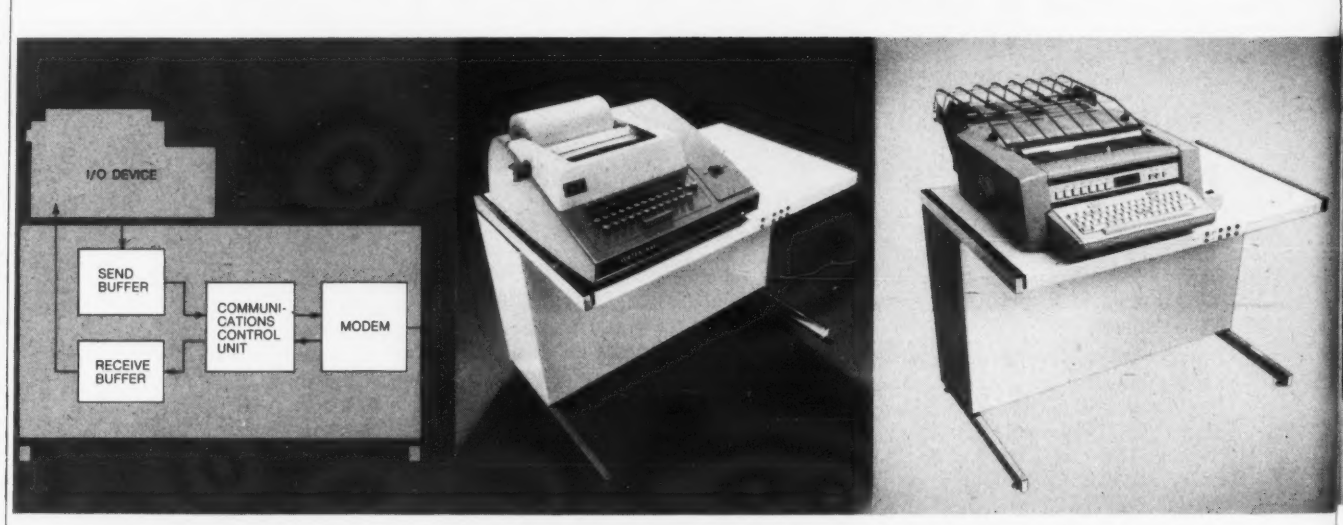


The Wiltek difference. The Wiltek terminal combines high speed with the ability to batch data and transmit it *automatically* over standard dial-up facilities. Two unique 50,000 character storage buffers are built into the Wiltek terminal. One temporarily stores incoming data, the other outgoing data. The buffers enable the terminal to send and receive large amounts of data during a single call – *and with no interruption of data entry.* Data moves fast, phone calls are brief. Transmission costs go down more than 50%!

The Wiltek Model 300 is the most economical Wiltek keyboard entry terminal, suitable for low to medium volume locations. Like all Wiltek terminals, the Model 300 automatically makes error checks during transmission. At a large oil company which recently installed 300's in its regional field offices, terminal operators used to spend hours each day re-entering garbled messages. Automatic detection and re-transmission has resulted in more efficient operation and considerable cost savings.

The Wiltek Model 400, with its 30 cps KSR, is perfect for high volume locations. Several corporations use the Model 300 (left) at all remote locations and the Model 400 at corporate headquarters. A packaging company uses 400's at a central location to receive reports from offices around the country on the status of shipments in transit.

and save hundreds
of dollars in th

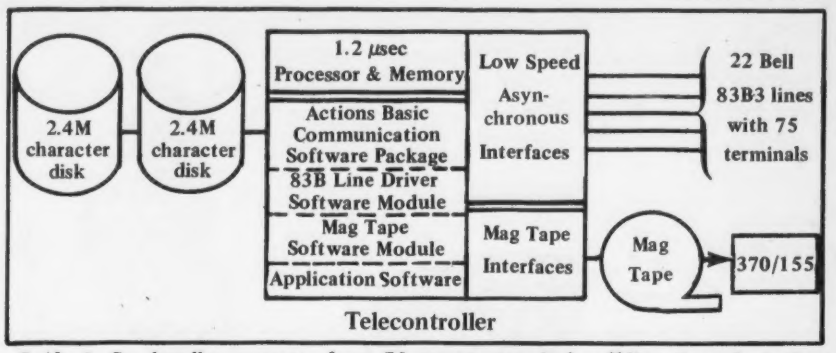
Off-Line Telecontroller Makes 'Swift' Work of 75 Terminals

CHICAGO – Keeping track of 75 outlying teleprinters without unduly impacting a main CPU can be a formidable problem. But Swift & Co. manages to operate an administrative message system off-line with a programmable communications processor.

The firm previously used a 360/30, also as a free-standing off-line system to keep track of messages from its remote sites. "We were running message switching as part of a DOS package using the old CCap program," explained Ralph Woods, communications manager at Globe Decision Services Inc. Globe is the Swift DP subsidiary that operates the Swift communications system.

The company issued invitations to bid to eight vendors when it was decided to replace the Model 30, Woods said. Of the eight "full-blown proposals," the company seriously considered five. Among these was an IBM plan to replace the Model 30 with a 360/25, Woods said.

A Telecontroller from Action Communication Systems Inc. was chosen because it had the best price/performance ratio compared with the other systems including the Model 25, Woods said. In addition, Action seemed to be "in a better position to respond to our software needs," he said.



Swift & Co. handles messages from 75 remote terminals off-line through Action Communication Systems' Telecontroller, a programmable communications processor.

'We Were Chicken'

Part of the specifications detailed by Globe included the contingency capability to connect the message switching system to the firm's 370/155 later on. Asked why the system was operating off-line with mag tape being manually transferred to the 155, Woods said, "We were chicken. We wanted to prove that the Telecontroller would do what they said it would before we took that next step."

The Globe/Swift operation is a high-volume message system. The Telecontroller handles administrative messages from 75 Model 28 TTYs with 25 machines located in the greater Chicago area and the remainder spread across the country.

Data flowing into the Telecontroller includes accounting and financial information; sales, price and order data; and other operational traffic.

One application is a data collection system that gathers information from pork plant locations on every hog that is killed. Each hog is covered by a 10-digit "message" that includes the lot number, grade and weight of the animal, Woods said.

This data comes in as the pork plant sites are polled by the Telecontroller. It is then "spun off" onto mag tape for entry into the 155.

The next morning, during the early hours, the processed data is transferred back into the "line queues" and transmitted back to the remote sites. The pork plants are told which weights and pork grades currently represent the best buy based on market conditions. In addition the plants receive data on what type of yields they can expect from the hogs butchered the day before.

"This is a high volume, low margin type of business," Woods explained. So the processed data is designed to tell the buyer where he should be looking for best buys. In addition it tells plant managers whether their buyers have done a good job of grading live hogs, Woods said.

Traffic Spread Out

The relatively slow speeds of the TTYs operating at 10 char./sec "hasn't really hurt yet" because the network is essentially a data collection application rather than a real-time inquiry response operation, Woods said. "We can spread our traffic out during the day as long as we get it all in by the end of the day."

The Telecontroller polls each station on the network. Each site is polled "five times per hour at the very minimum," Woods said. "When we pick up a station we will accept only one message at a time. The site might have four messages on the paper tape but we limit the transmissions to the Telecontroller to one message."

The system runs 12 hour/day and transmits between 2,000 and 2,500 messages each day from the central site in Chicago. These also include messages being sent to Chicago to be retransmitted to other sites. This is done with the Telecontroller's store-and-forward capability.

The TTYs operate with a Bell 83B3 control mechanism that is used to poll and address each station. The firm has thought about upgrading to faster units which will probably "be in the printer category," Woods said, "although CRTs have also been considered."

Another enhancement possibility is the addition of a TWX/Telex interface from Western Union. This could be connected directly to the Telecontroller to expand the present message switching net.

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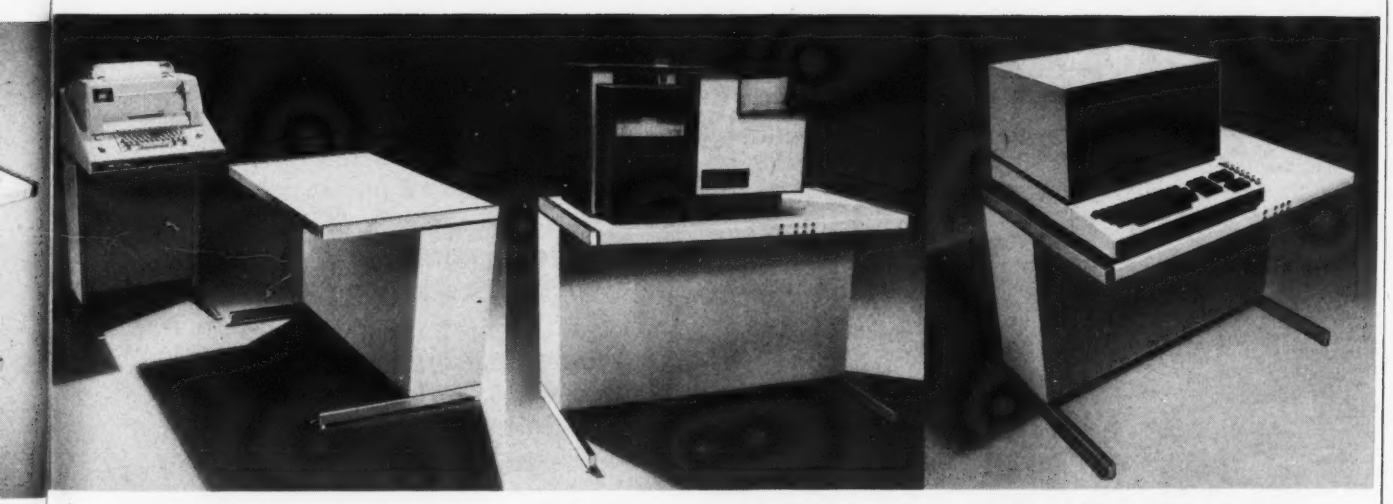

The Wiltek Model 350 is used where many copies are required or where almost continuous operation is expected. A chemical company uses 350's at its regional offices where sales orders are entered on four-part forms, and at its plants where the orders print out on eight-part forms.

The Wiltek Model 820 terminal transmits punched card data from remote locations. A major manufacturing corporation has installed Model 820's to transmit payroll data from forty plants to a single computer center for centralized processing. The same system also employs Model 400 terminals at all locations to handle administrative messages.

The Wiltek Model 500 terminal uses an advanced CRT with 2000-character display. The 500's editing features make entry of formatted data fast and easy. A nationwide delivery service using the Model 500 to enter package tracers increased operator output by 50% over the previously used teletypewriters.

Our new booklet shows how Wiltek's terminal concept can make corporate data communications more efficient and less costly. Write Robert Colella, Commercial Marketing Manager, Wiltek, Inc., Glover Avenue, Norwalk, CT 06852.

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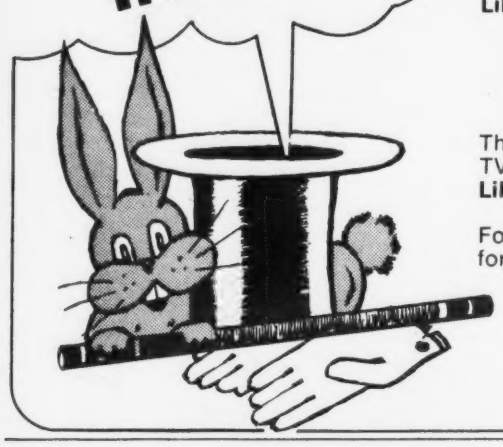

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CRT Display Terminals Augment Dartmouth's Classroom System

HANOVER, N.H. – Dartmouth College, like other progressive educational institutions, has brought the computer into the classroom. With over 130 Model 33/ASR TTY units available to students around the campus, 50% of all students use the computer in any given month, and 90% use it in a year's time.

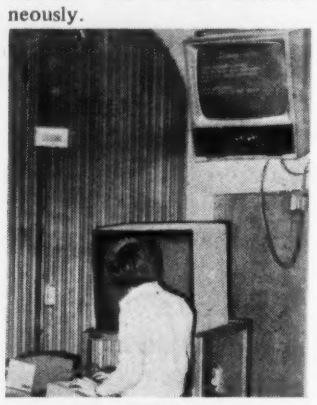
But by adding CRT displays, Dartmouth was able to make the computer a more useful classroom educational tool. While the school has had TTY terminals in the classroom for several years, it was previously necessary to employ closed-circuit TV cameras to get the TTY printout displayed on a screen for all students to see at once.

A problem with the TV approach, according to Steve Garland, assistant director for education and planning, was that the teacher had to spend much time focusing the camera.

In addition, resolution and contrast were bad because the camera had to "look through" the plastic shield which covered the printout.

The CRTs now used make any information printed on the TTY instantly produced on the screen.

An advantage of the computer/CRT display system is that students can use the system to test problem results. If a student is not sure of the result of a given input he can try it anyway and obtain the result instantaneously.



Dartmouth student solves math problem using computer/CRT display.

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Operating management can be broken into two areas. The first is designed to prevent the surprises that come from rapid growth and result in system overloading. System records of such items as number of transmissions, line time used, etc. are relatively easy to keep.

These can, and should, be kept through either software or simple transmission logs. These are very important in determining long-range requirements and future needs.

The second area – recording system downtime – is even more important. This is what will actually determine the ability to maximize system throughput and simultaneously minimize system downtime. Actually, by reducing downtime the true data throughput is increased.

The first step in increasing this throughput is to determine where system failures occur. The statement, "We have a lot of trouble with X," is not good enough. It is necessary to establish relative percentages of downtime for major system items such as terminals, modems, circuits, CPU and software.

This record should include the standard items of when the system went down and came up; what failed (established after failure indicates area of trouble); and elapsed downtime.

In dealing with a carrier or circuit supplier it is also important to record the name, initials or service report number. This is required because the carriers do not appear to keep accurate records of their own service calls.

In cases where a user has to review an operating problem with his carrier, complete information is vital. It can make the difference between correcting a line fault immediately or requiring the carrier to first retrace the original repair effort.

The record of calls becomes important in determining the "weak link" of a system. In the case of equipment with alternate vendors it is possible to replace this trouble area with competitive equipment. In the case of circuit problems the call record is required to establish refunds due.

The actual refund received is negligible and certainly provides no reason for the recordkeeping. However, the records can point to troublesome segments of the circuit which can be replaced. As such they can be valuable to the carrier and the user in eliminating problems.

In addition, they will provide the records necessary to request help from the regulatory body governing the carrier. As a purchaser of a service it is logical for the user to expect service from the supplier. However, with limited sources, such as existing or specialized carriers, some higher appellate body may be necessary.

This is either the FCC for interstate circuits, or the state regulatory body for intrastate circuits. If supplied with factual back up of dates, times and reasons for carrier failures they will be very helpful in securing the operating system desired. As a purchaser of service, when all other avenues fail, no user should hesitate to contact the regulatory body.

The manager of a data communication system has the responsibility of maximizing the efficiency of his system. Without good records efficiency is impossible.

Richard A. Kuehn is president of RAK Associates, Cleveland, Ohio, a communications consulting firm specializing in the design of private line networks.

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Voice Units Vary From Touch-Tone to Integrated CRTs

By Glenn E. Dawson
Special to Computerworld

Voice response units have been developed from a variety of approaches by a number of different companies. However, the specific technical approaches to handling the voice signal are of little interest to the user as long as output responses are recognizable and the price remains reasonable.

The major components of voice response systems can be divided into the communications equipment which transmits the tones and voice reply, and the computer equipment which processes the input inquiry and generates the voice reply.

The most popular terminal is the Touch-Tone telephone. However, independent manufacturers have developed their own terminals; over 50% of these make a Touch-Tone-type transmitter. Others provide limited hard-copy, increase the size of the keyboard beyond 12 keys, etc.

The use of the telephone as the only computer terminal does constrain the effectiveness of voice response. Some of these constraints have to do with the lack of extensive hard-copy; the necessity to encode control or alphabetic characters using simultaneous key depressions or extended keying; the appearance of keying errors; and the unavailability of the Touch-Tone telephone.

Unnatural Response

Historically, the unavailability of voice response units with many lines and a large vocabulary also inhibited the development of many attractive application areas. In addition, responses formed from the individual words stored in the limited-vocabulary devices resulted in a somewhat staccato response that sounded unnatural.

Some constraints (e.g. no hard-copy) can be considered disadvantages only when applying voice response inappropriately, since it is these constraints (e.g. the elimination of paper) that makes voice response attractive in other areas. Obviously, system constraints offer opportunity for creative product and system design.

Today, many banks have integrated voice response with alphanumeric CRT displays. The CRTs are used typically to obtain detailed information concerning an account whereas voice response is used primarily to obtain the status of an account.

Using voice response to complement and increase the flexibility of CRT-based computer systems is expected to increase rapidly throughout all industries during the 1970s and beyond. The key to such growth will be the introduction of more applications-oriented systems. Such systems should encompass not only voice response, CRTs and hard-copy capability, but also applications software.

Low Cost: Good and Bad

The major reason for the appeal of voice response to the computer user is its overall low cost. Of course, this is precisely why the major equipment vendor is sometimes uninterested in discussing voice response.

For example, a hypothetical banking system might have 12 telephone lines, a 64-word vocabulary and eight local CRT displays. Based upon summer 1972 prices, the cost of such a configuration might range from $2,300/mo from Wavetek to $3,600/mo from IBM. Approximately $1,000/mo is spent on the eight displays.

However, the 12 telephone lines might service 200 telephones or separate locations. Using only CRTs and placing one CRT at each of the 200 locations might then increase the monthly cost to the computer user by some $25,000/mo.

It is obvious that the equipment vendor would concentrate on selling the large CRT systems without voice response. It is just as obvious that each computer user should persist in investigating the applicability of voice response in his own company.

The main advantage of voice response is that the telephone is the only device that needs to be seen by the user. This is the key to its low cost, speed, simplicity, flexibility, acceptability and adaptability.

Voice response systems are cost-competitive with other data input and retrieval methods when many people must access a large and rapidly changing data base, when an immediate decision such as check cashing must be made, or when a simple inquiry can be answered with a short reply.

Who Are the Vendors?

The IBM 7770 Audio Response Unit is the industry standard largely because it probably represents 85-90% of all voice response installations. The IBM 7770 can have from four to 48 lines and 127 maximum 0.5 sec long word segments.

Other voice response vendors are American Systems, Burroughs, Cognitronics, Datatrol, Federal Screw Works, Honeywell Information Systems, Metrolab, Periphonics and Wavetek.

Systems offered by the newer companies such as Datatrol and Wavetek are, for the most part, based on minicomputer techniques and hence can operate as stand-alone systems. This makes them extremely flexible and in essence they become programmable communications front ends capable of servicing a variety of different terminals and communciations techniques.

Glenn E. Dawson is president of Alltech Computer Systems Inc., a publishing and consulting firm in Pennsauken, N.J.

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Bits & Pieces

370/145 Users Offered Monolithic Add-On Memory

LOUISVILLE, Colo. – Users of IBM 370/145 models I and II can obtain a plug-compatible solid-state monolithic memory system from Storage Technology Corp. (STC).

The add-on is a self-contained unit allowing users to add up to 1,024 bytes of storage for both IBM models.

System features include: use of high-performance monolithic memory chips; error-correction code electronics that detect and automatically correct single-bit errors. pluggable memory arrays that allow in-line repair; modular and independent power supplies with each unit for maintenance and upgrading; and in-line diagnostics for fault isolation.

Deliveries are set for September 1973 at prices 12% to 20% below comparable IBM memory systems, the firm said, from 2270 S. 88th St., 80027.

Data 100 Adds Print Station

MINNEAPOLIS – Data 100 Corp. has added the Model 75 Print Utility Station to the company's Seventy Series family of remote batch terminals.

Designed as a stand-alone tape-to-print station, the basic Model 75 configuration includes a 1,000 line/min printer, a 9-track – 800 or 1600 bit/in – magnetic tape unit, a video display console and a 12K-byte memory terminal control unit.

A card reader and 1250 line/min printer are optional.

The off-line terminal system utilizes standard IBM DOS- and OS-generated tapes with internal software permitting the operator to define record and block-length characteristics of the tape to be printed.

Basic lease price on one-year lease is $1,780/mo including maintenance from 7725 Washington Ave. S., 55435.

OCR System for Typeset Users

BEDFORD, Mass. – A laser-based Optical Character Recognition (OCR) page reader system is available from ECRM, Inc. for computerized typesetting applications.

The Model 5100 is set up to read OCR-A and IBM Courier 12 fonts at speeds up to 250 word/min while maintaining an error rate of less than .01%.

Basic hardware includes a single cabinet containing both the scanner subsystem and processing units. The processor is a PDP-8 with 16K of core memory.

Available options include an on-line keyboard/display console and a 75 char./sec paper-tape punch.

System price is $29,500 from 205 Burlington Road, 01730.

Fourier Processor for Mini Users

NORTHRIDGE, Calif. – Spectra Data's new Model 1040 is a stand-alone, hard-wired, Fast Fourier Transform processor.

It is designed to increase the speed of any computer in arithmetic operation involving Forward and Inverse Fourier Transform, Power Spectrum, Cross Power Spectrum, Cepstrum and others.

Plug-in interface cards adapt the Model 1040 to operate with standard computers such as those manufactured by Digital Equipment Co., Data General and Varian Data Machines.

Price of the processor is $11,250 from 18758-6 Bryant St., 91324.

. . . for Katakana Coders

DALLAS – Recognition Equipment's "Total Data Entry" systems now offer the ability to process data printed in Katakana as an option.

Katakana, the Japanese font derived from the basic Japanese language, Kangii, is the EDP industry standard for Japan.

Model 4 Supercharger

1130 Device Can Save Users $1,000/Mo

By Michael Weinstein
Of the CW Staff

TORRANCE, Calif. – IBM 1130 users may save up to $1,000/mo system rental with modules from Logicon, Inc. that supercharge an 1130 Model 4 so that it has the same capabilities as the faster 1130 Model 2.

The basis of this savings is a module that bypasses delay circuitry in the standard IBM Model 4.

Once these circuits are passed, the Model 4 is essentially the same machine as the more expensive Model 2, according to a spokesman for Logicon.

The standard Model 2 has an internal cycle time of 3.6 μsec and is available from IBM with core memory from 4K to 32K 16-bit words.

Users can have one 2310 disk subsystem with a 500K-word storage capacity incorporated in the mainframe of the Model 2.

Optionally, Model 2 users who want to add extra disk drives and a faster line printer can use the Storage Access Channel (SAC) from IBM at a slight extra charge.

Without the SAC, users are limited to the one internal disk drive, an 1132 type printer (100 line/min) and a card reader/punch.

The 1130 Model 4 is essentially a "crippled version" of the Model 2, according to the spokesman.

The delay circuit used by IBM in building the Model 4 effectively reduced operating speed from 3.6 μsec to about 5.7 μsec. This slowdown results in a machine that is about 62% as efficient as the Model 2, he added.

While the Model 2 could have up to 32K words of core memory, the Model 4 is limited to a maximum of 8K words. Further, the Model 4 does not allow for the SAC and users can not attach extra disks.

The inability to attach the SAC means that Model 4 users are limited to the internal 2310-type disk drive, 1132 printer and card reader/punch, the spokesman related.

Curing the Lame

Logicon's adapter consists of circuitry and a switch that bypasses the IBM delay circuits. With the switch users can switch back to a standard Model 4 at any time to meet IBM maintenance requirements.

Included in the adapter is the SAC, so that Model 4 users with Logicon's module can operationally turn their system into a Model 2 with SAC.

The adapter is available as a part of two packages: add-on memory or controller option.

Add-ons for the Model 4 are available in 8K-, 12K-, 24K- and 28K-word versions. Rental costs for these add-ons on a three-year lease are $345, $585, $660 and $815/mo respectively.

For an additional $50/mo, users can have the adapter with the SAC and speed-up switch.

Users can thus attach 2314-type disk drives, a 600 line/min printer and IBM-compatible 7- and 9-track tape drives.

The other option is to get the speed-up switch and SAC with the Logicon Peripheral System (LPS) – a controller for attaching faster peripherals to the Model 4.

Cost of the LPS with the adapter is $780/mo on a three-year lease. This rental includes one 2314-type disk drive with a 10M-word storage capacity.

To put potential savings into perspective, the spokesman outlined two hypothetical users:

User A has an 1130 Model 2 with 32K words of core memory and the SAC – all from IBM. He pays about $2,460/mo rental on this configuration.

User B has an 1130 Model 2 with 32K words of core memory from IBM. He also has 28K words of add-on memory, the adapter switch and the SAC from Logicon. User B pays $450/mo rental to IBM, $815/mo for the add-on memory and $50/mo for the switch-SAC to Logicon, for a total monthly rental of $1,315.

Operationally, Users A and B have the same capability, except that User B is paying about $1,000/mo less than his all-IBM counterpart.

Logicon is at 24225 Garnier St., 90505.

Parallel Four-Bit Word Microcomputer Available for $695

IRVINE, Calif. – For $695, users can obtain a parallel 4-bit general-purpose microcomputer from Applied Computing Technology, Inc.

The microcomputer is totally self-contained on a single printed circuit board (PCB) with a cycle time of 11.8 μsec.

The unit consists of five basic elements: a central processing unit, a read-only memory (ROM) for assembled program storage, a random access memory (RAM) for data storage, an expandable universal I/O bus and a computer clock.

The CPU includes subroutine stack nesting to three levels, four program stack registers, 16 index registers, one instruction register, accumulator, accumulator buffer, adder buffer, a 4-bit adder, I/O buffer, memory and I/O address selection and control section.

The ROM program storage may be mechanized with conventional electronically controlled programmable and erasable programmable read-only memory (Prom).

Options include RAM data storage expansion in increments of 80-word RAM IC chips to a maximum of 1,280 words and ROM assembled program storage expansion in increments of 512-word pre-programmed ROM IC chips to a maximum of 8,192 words.

Applied Computing Technology, Inc. is at 17815 G Sky Park Circle, 92707.

Traffic in Stolen Credit Cards May Stop With Terminal System

WILMINGTON, Del. – Stealing credit cards may soon lose its standing as one of the most lucrative of criminal operations.

A terminal-based verification system can now read the embossed lettering used in most credit cards.

The system, from Data Source Corp., is currently being used in a joint venture by two Wilmington banks offering Master Charge credit cards.

Caught in the Act

With the new system, "it is entirely possible for a thief to rob a victim of his credit card, go to a retail store and be caught trying to make his first purchase with the card," explains Sam Grey, vice-president of the Wilmington Trust Co.

Grey's bank, in cooperation with the Farmers Bank of the State of Delaware, is currently using the system to verify credit on more than 81,000 credit cards.

Since installation in November 1972, more than 500,000 transactions have been checked by the system, and more than 1,000 improperly used cards have been detected and/or confiscated.

Not only does the terminal system detect fraudulent credit cards, but it will instruct merchants to deny credit to a cardholder who has exceeded his credit limit.

"In addition, it monitors the credit card's spending pattern, said C.J. Milione, vice-president at Farmers Bank. "If a customer's card suddenly is being used in an unusual spending spree, a merchant will be instructed to verify that the proper person is using the card."

The system consists of credit card reading terminals, a minicomputer-based controller and software for the credit center's host computer.

Presently, 266 terminals are installed in more than 180 merchant locations connected over private lines to the minicomputer-controller.

The minicomputer in turn is connected directly to the computerized credit data files at the Eastern States Bank Association.

Omnipresent Switch

This central computer is part of a computerized network (called Omniswitch) that allows the two local banks to obtain data on cardholder accounts of more than 2,900 Master Charge issuing banks across the nation.

In operation at the local level, a merchant presented with a credit inserts the card into a terminal, indicates the purchase amount and pushes a button.

Within seven seconds, he is told whether to honor or confiscate the card, or he is given other instructions.

With the Data Source 800 network being installed, the next step will be to capture data needed to prepare itemized customer bills each month and cut down the huge amounts of paperwork presently required to handle and process credit slips and prepare customer bills.

Another application under study is to have the system used for check verification to help merchants solve the problem of bad checks.

Data Source Corp. is at 2350 Alaska Ave., El Segundo, Calif. 90245.

Multi-Channel Data Acquisition System Offered Mini Users

SANTA ANA, Calif. – Data Technology is offering users a multi-channel (expandable to 1,024 channels) data acquisition system.

Designed primarily for applications such as production testing, simulation instrumentation, vibration analysis and pollution monitoring, the Milliverter II features either fixed or programmable gain track and hold amplifiers.

Low- and high-level signals are handled with a combination of five interchanged amplifier and extender cards inserted in 16 positions of the chassis. Thus, the spokesman added, when system requirements change, the cards may be repositioned.

The Milliverter II is available at a base price of $3,250 plus amplifier cards. Interfaces to most minicomputers are available with conversion timing controlled either by the CPU, by an included interval timer or from an external signal source.

Delivery is from stock from 2700 S. Fairview Ave., 92704.

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Random Access Systems

Floppy Disks Announced for Mini Users

SANTA ANA, Calif. – Standard Logic has introduced two floppy disk storage subsystems, the FD-8S and the FD-8H, that can operate with a variety of minicomputers.

Both systems incorporate an interface, a formatter and a random-access cartridge-loaded floppy disk drive.

Both systems can incorporate up to four floppy disk drives and can operate with DEC PDP-8 and PDP-11; HP 2100; Tempo II and Data General Nova 1200 computers.

Using optional plug-in modules, the systems can be adapted to any minicomputer, according to a spokesman for the firm.

The FD-8S offers 131K byte/track. There are 64 track/drive with 8 sectors of 256 byte/sector. Track-to-track access is 6 msec with a 34 msec head settling time for the last track. Transfer rate is 4,200 byte/sec with a 333 msec average latency time.

The FD-8H is a larger unit with 262K byte/drive. It has 64 track/drive with 32 sectors of 128 byte/sector. The track-to-track access is 10 msec with a 10 msec head settling time for the last track. Transfer rate is 31,200 byte/sec with an 80 msec average latency time.

Price for either floppy disk subsystem is $2,500 from 2215 S. Standard Ave., 92707.

NCR Adds Two Peripherals To 399 Series

DAYTON, Ohio – NCR has added two new peripherals for users of the firm's 399 Series computer.

New peripherals include a 300 line/min printer – previously NCR provided a 125 and 200 line/min printer for the 399 – and an automatic ledger feeder-reader.

The 314 ledger feeder-reader reads and transmits data recorded on magnetic ledger cards, serving as an auxiliary input to the system.

It can read up to 47 11-in. cards/min and is cable-connected to the 399's interface board. The unit can read magnetic cards from 6 to 16 in. in length and 8 to 15 in. in width.

The NCR 349-300 printer is priced at $17,000 and rents for $460/mo. The printer will be available in the third quarter of 1973.

The NCR 314 ledger feeder-reader is priced at $6,000 and rents for $185/mo. Availability on this unit is the second quarter of 1973.

...Moving to OCR-A

Optical Scanning Unveils New Unit

NEWTOWN, Pa. – The ability to read the full OCR-A character set plus special characters printed by a Selectric typewriter or high-speed computer printer are highlights of Optical Scanning Corp.'s OpScan 37.

The optical character recognition system has an option for reading handprint and mark reading, also.

In operation, the OpScan 37 may be used in a freestanding configuration providing records on magnetic tape or communication on-line with a central processor – remote or local.

Various output options such as magnetic tape, cassettes, printers, card punches, computers and telecommunications equipment are available.

Speed depends on the size of documents being handled, with 2 in. by 4 in. forms read at 2,500/hr. Full 8-1/2 in. by 11 in. pages are read at 270/hr.

A special program sheet for each format to be scanned is provided with the system. This sheet tells the scanner where to read, what to read and also formats the output without requiring software intervention. To change from one format to another the scanner only inserts the proper program sheet.

The OpScan 37 sells for $45,000. Monthly rental is $1,475 (not including maintenance). The firm is reachable through P.O. Box 40, Rt. 332-E, 18940.

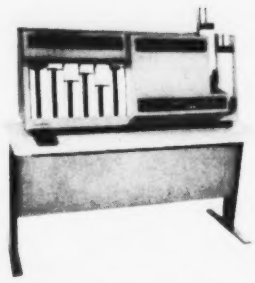
NCR Adds OCR-A Font To Adding Machines

DAYTON, Ohio – NCR has added the OCR-A font as an option on its line of full-keyboard adding machines.

"The availability of this industry-standard font on our full keyboard adding machines allows them to be used simultaneously for bill validation and data entry through any variety of Optical Character Recognition (OCR) readers," a spokesman for the firm stated.

The OCR-A optical font is available immediately as a factory-only installation at $50 extra charge.

DO-IT-ALL



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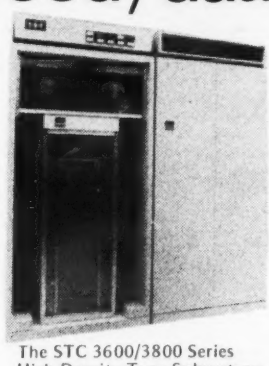

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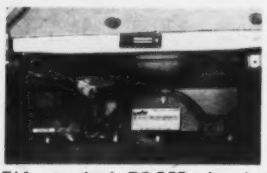

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Adapts Model 33 or 35 Teletype terminals to Telephone Company data sets (103A, 103F, 113A, 113B, etc.) or other modems which require EIA standard RS-232 electrical interfacing. Designed as a low-cost alternative to other methods of interconnection, the Data Set Coupler utilizes solid-state circuitry to convert the 0-20 ma. dc current interface of the Teletype to a two-way EIA-compatible voltage interface. Self-contained unit installs in minutes without drilling or soldering: clamps onto pedestal next to tape reader power supply and plugs into rear panel of Call Control Unit. Supplied with interconnecting data set cable. **$45.00**

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UNITED DATA SERVICES COMPANY, INC.
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Formatter Aids Diskette System Design

(While equipment in this column is primarily for Original Equipment Manufacturers [OEMs], in most cases it is also available in single units to interested users.

Further, the equipment that is not presently available does give some indication of techniques that may be incorporated in end-user equipment in the near future.)

BEDFORD, Mass. – Innovex Corp. has a disk formatter for its line of "diskette" moving-head storage devices to aid designers in interfacing information processing systems.

The formatter can function with 8-, 12- and 16-bit word machines and control up to eight floppy disk drives.

A 16-bit bidirectional bus is used between the formatter and central processor to transfer command words, status words and other disk-oriented data received by the central processor.

Operationally, the formatter accepts new address information and initiates the seek operation on the appropriate diskette drive. Seeks can be performed on all drives in parallel. Following a seek completion, the formatter checks that the head is on the correct cylinder.

Two-frequency encoding is used in writing operations with a parity word entered at the end of the data field.

In cases where the information is unavailable or the sector can-

New OEM Products

not contain the entire record due to length, an error flag is posted and an appropriate bit is set in the status word.

Following a head command, interrupts are generated for each data word. If a parity error is detected or the processor fails to accept a data word, then an error flag is raised at the end of the record.

The command word consists of 8 bits and may be transmitted as either a single word or used individually; status words are in 12-bit format and contain three error-detecting bits to control seeking, reading and timing errors.

Price of the diskette and formatter package is $2,740 with quantity discounts available from 4 Alfred Circle, 01730.

Two 80-Col Punched Card Units Unveiled

MELBOURNE, Fla. – Documation, Inc. has a reader/punch and card reader.

The RP-100 reader/punch for 80-column cards features a side-friction picking system with positive roller-controlled transport, a cam-driven punching system and automatic verification in its punch operation.

Punch operating speed is between 100- and 250 card/min – depending on the number of columns punched. Reading speed is 400 card/min.

OEM unit price is $11,750.

The D-400 is a high-speed, table-top card reader with a reading speed of 400 card/min for standard 80-column cards.

Hopper capacity is 800 cards and stacker capacity is 1,000 cards, both of which can be loaded on the fly.

OEM unit price is $1,650. Both units are available from 371 New Haven Ave., 32901.

Tape Reader for Block Data

SANTA ANA, Calif. – The Data Loader is a punched tape reader designed for OEM applications requiring reading for sequential block data loading.

The unit operates synchronously, at up to 150 char./sec and is TTL/DTL/RTL compatible.

Options include choice of directions, bidirectional operations, run/stop and remote control relay assembly, inverted logic and optional packaging.

Price in unit quantity is $285 from Electronic Engineering Co., 1441 E. Chestnut Ave., 92701.

MOS/LSI Devices Announced

NEWPORT BEACH, Calif. – Western Digital Corp. has announced two programmable MOS/LSI devices.

The P/SAT converts variable-length parallel characters into a serial data stream, while the P/SAR converts a variable length serial data stream into parallel characters.

Prices in quantities of 100 to 999, the P/SAT is $21.70 and the P/SAR is $26.05. The firm is at 19242 Red Hill Ave., 92663.

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First ACM Committee Meeting Reveals Clear Split Between Theory and Practice

By Michael Merritt
Special to Computerworld

PALO ALTO, Calif. – The first meeting of an Association of Computing Machinery special interest committee on measurement and evaluation revealed a "town and gown" split between academics concerned with the theory of computer performance and "practitioners" finding data on real systems and trying to get computer systems to perform to specifications.

The World of Measurement

Speaking at the opening session of the three-day meeting which was attended by over 200, Peter Denning of Purdue University suggested that the whole business of performance evaluation is backwards anyway. "We put in a system," Denning said, "and then ask how it should operate. We want good performance, but we don't know what good performance is."

The appropriate procedure, Denning said, is to first define the classes of jobs a system is to do, and develop performance standards for those jobs. Then virtual machines can be designed for each class, and real machines designed to simulate the virtual machines.

The idea, according to Denning, is to move from a needed level of service to a machine, not from a machine to a level of performance – system the model, not model the system.

Denning's suggestion aroused some response from the "practitioners" in the audience, who contended that the idea was utopian, and that users have to work with what they have now.

Steven Kimbleton of the University of Michigan and chairman of the special interest committee, also pointed out the disparity between theory and practice in DP evaluation.

Most of the work now being done, he said, concerns the properties of one job or one system. What is needed, according to Kimbleton, is some measure of performance of larger computer subsystems from the viewpoint of the user organization.

The DP manager, for example, needs to know ways of determining the size and characteristics of systems to be purchased, Kimbleton said. There is just no computer system selection methodology, he added.

Erol Gelenbe of IRIA, a French research institute, delivered a paper on optimum page size in demand paging systems using drum, extended core storage, or large core storage as the secondary memory medium; the only systems, though, which permit users to select page size are the 370 Series and Multics, which only permit a choice of two sizes.

The work of Gelenbe and his colleagues showed that optimum page size depends on several factors, including the nature of the secondary memory device, how long a program spends in the CPU queue after a page fault, and the increase in the number of page faults as page size gets smaller. (A page fault occurs when code needed by the CPU is not in the page currently in primary memory.) Program size was one of the secondary factors in determining optimum page size, Gelenbe said.

The best way to hook up more than one drum memory to a computer is to dedicate an I/O channel to each drum and to use a shortest-latency-time-first (SLTF) organization, rather than a first-in-first-out organization, or multiple drums per channel, for minimum response time, according to Samuel H. Fuller of Carnegie-Mellon University.

The SLTF organization, though, practically requires positional sensing hardware and software, only available on more modern drums. A complicating problem, Fuller's work revealed, is that a computer's page size may not be an integral of the track length of the drum memory.

Jon Strauss of Washington University in St. Louis presented an analytic model of an improved Hasp execution task monitor. The Hasp ETM controls the OS/360 dispatching chain, and the current version gives execution priority to jobs showing little CPU utilization. According to Strauss, this gives I/O-bound tasks priority over CPU-bound tasks.

Strauss's model showed that the current monitor does work, but is most suited for situations where the various task classes show the same amount of CPU utilization. One improvement he suggested was the addition of a factor reflecting differing memory speeds if the system uses large core or extended core storage.

Dr. Ruth Davis of the National Bureau of Standards delivered a luncheon address to the conference, and spoke of the need for the development of measurement, evaluation and standards tools to make acquisition of computer systems a more rational process. Users have been too willing, she said, to buy systems without really knowing how they perform.

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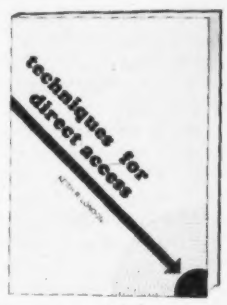

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Enoch Haga, coeditor, Automedica and executive director, Society of Data Educators.

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Keith London, consultant, author of Documentation Standards.

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Ralph Szweda, Professor of Data Processing Sciences, Monroe Community College, New York.

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Sang Lee, Professor of Management, Virginia Polytechnic Institute and State University.

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Total City Ledger System Now Possible at Hotel

By Toni Wiseman
Of the CW Staff

CHICAGO – Better control, greater efficiency and the ability to grow in the future with proportionate increases in staff are the major benefits resulting from the use of a new computer to implement a total city ledger system at the Drake Hotel.

According to Drake comptroller Henry F. Stec, "From an overall point of view, we are now collecting and processing information which we are able to efficiently and effectively use not only for accounting purposes, but as a marketing tool to promote increased business,"

The initial computer application at the hotel was made in 1966, when tip reporting requirements of the Tax Adjustmert Act of 1966 and new graduated income tax regulations made the payroll application for the hotel's 1,100 employees too complex for a bookkeeping machine.

A computer program for payroll and personnel was developed and run on offsite leased equipment by Drake personnel.

At that time, accounts receivable were still being processed on four accounting machines since it was considered impractical to process them off-site because of the volume involved and the need for close coordination with other hotel records.

In April 1971, after an extensive period of investigation and experimentation, the Drake installed an NCR Century 100 system. The system includes a CPU with more than 32K of memory, two dual disk memory units each with 8.4M-character storage, a 450 line/min printer, card reader and input/output reader.

At the same time, conversion of accounts receivable was initiated, and a cutover to computer operations on this application was made in May 1972.

Today, the receivables system maintains in file 30,000 accounts.

The computer stores receivables data in five basic transaction files: Drake credit card master, non-credit card master, returned check, advance payment and Club International (a private club) dues.

Reports are produced daily on collections, payments on overdue accounts and financial transactions. Master account files are updated weekly, and at the same time a number of reports are printed out, including trial balance totals broken down in terms of percentages of credit- and non-credit-card activity.

Henry F. Stec (right), comptroller, views printout on NCR Century 100 system with B.W. Schuler, vice-president and general manager.

Dental Program May Facilitate Mass Treatment

PHILADELPHIA – A former public health department dentist working toward a doctorate in biomedical engineering at Drexel University has taught a computer how to examine teeth . . . well, not really.

Dr. Mark Shapiro's Computerized Mass Screening for Dental Decay system can examine 1,500 patients an hour and is seen as a major breakthrough in large-scale treatment programs.

"It isn't the sort of thing you'll see in your dentist's office," Shapiro said. "Its major benefit is in public health work where large populations have to be screened."

His system requires no dentists. Instead, a dental technician takes one X-ray of each patient's mouth.

On the X-ray film, decayed, filled or missing teeth show up as varying patterns of light and dark. Shapiro's machine translates these patterns into information the computer, a DEC PDP-12, can understand. The computer then prints out what it reads from the individual X-ray film or summarizes the data from an entire group.

'Unretired' Machine Aids Satellite Tracking

ROME, N.Y. – What connoisseurs of computers would call a "vintage" machine is doing up-to-date research in developing methods to identify orbiting artificial satellites. The computer is part of an experimental system devised by the Techniques Branch of the Air Force Systems Command's Rome Air Development Center, Griffiss Air Force Base, N.Y. The system is used to control the antennas that track the satellites, helping the system to establish the elements of orbits by obtaining the coordinates (altitude, azimuth and range) or the satellites.

The research effort has been established to develop improved techniques in radar systems designed to track satellites. The investigations are aimed at developing means of obtaining positive identification of artificial satellites by their radar signal returns.

The DEC PDP-1, introduced in 1960, has been on duty here for over four years, and was acquired from another Air Force facility that was "retiring" the machine after years of service.

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Statistical ABL System Making a Big Hit

By Ken Shonk
Of the CW Staff

BOSTON – The American Baseball League is now using a computer-based system to compile team and individual statistics. The system receives information on each game from the home team through facsimile transmission of the official scorecard to Sports Information Center, the contracted company, in Boston.

"We decided to start the operation," said John Harrington, the Boston representative of the American Baseball League, "simply because many of our clubs were already involved in computer systems on their own, running nearly identical operations. We just decided to coordinate them."

The first phase of the system uses the information from the scorecard to update player and team master files, starting from the first game of this season. The program then produces daily and weekly statistical reports on player and team batting, pitching and fielding averages.

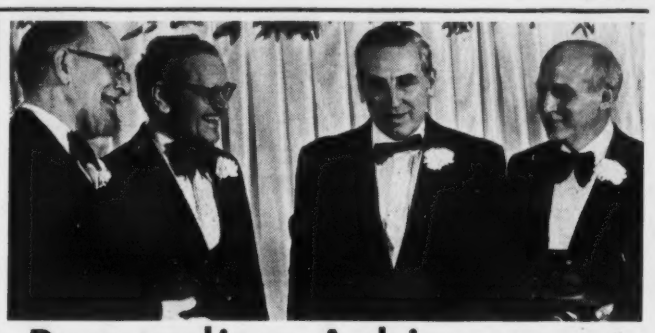
Intelligence Reports

"The system can also produce a variety of management and intelligence reports," James Scheivle of Sports Information Center reported.

"For instance, the system can compare the performance of one team against that of another, answering questions such as, how does your team or an individual player do against a particular team at night?"

In phase two the master files will be expanded to include information on previous seasons so that the system will be able to provide a complete history of each player, Scheivle added.

"The short time we had to start up the system and get it running by the time the baseball season opened was our biggest problem," Scheivle said.



Rewarding Achievement

Two Delaware Valley scientists who codeveloped one of the world's first all-electronic digital computers 27 years ago are winners of the 1972 Philadelphia Award for outstanding service. Left to right are Dr. John W. Mauchly of Ambler, a recipient; Dr. Marvin Wachman, president-elect of Temple University and chairman of the Philadelphia Award Board of Trustees; Walter Phillips, a board member; and Dr. J. Presper Eckert of Gladwyne, also a recipient.

Code, Terminal Allow Stroke Victim to 'Talk'

By Toni Wiseman
Of the CW Staff

BURLINGTON, Vt. – The mating of a computer terminal and the Morse code has enabled a stroke victim to communicate in words for the first time in nearly a year and a half.

The project was begun by four electrical engineering students at the University of Vermont who set out to solve the problem of providing a means of communications for a paralytic who had only the slightest control over the fingers of his left hand.

The finalized system uses a commercial electronic key to input information, via Morse code, into a computer terminal. There the binary information signal is processed and the output written in alphanumeric characters on a television screen.

Two-Key System

The information is input from two keys, one each for dit and dot, which send continuously at variable rates from six to 60 wpm. The student-designed system uses solid-state logic and integrated circuits to convert the electrical impulses into a language which the television device can interpret.

The students have been approached by the Vermont Crippled Children's Association which hopes the engineers will be able to apply their current knowledge to the problem of cerebral palsy victims.

low, medium and high speed models, simultaneous operation of multiple peripheral devices, multi-leaving, easy field expandability with no costly down-time and plug-to-plug compatibility with IBM, CDC, Univac, Honeywell, etc. There are many more reasons why, but we've made the point.

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Hideo Hirayama, President of Dempa Computerworld Company and Patrick McGovern, President of Computerworld, Inc. look at the first copy of Shukan Computer.

Dempa Publications is the leading Japanese electronics publisher.

Dempa publications is currently the leading Japanese publisher of information services on electronics, including *Dempa Shinnbun*, the 200,000 circulation daily newspaper of electronics. Dempa maintains twenty-five editorial offices throughout Japan, the U.S. and Europe, which, along with *Computerworld's* editorial staff and correspondents, will provide the largest newsgathering organization of its kind in the world.

The Staff of Dempa Computerworld Inc.

Dempa Computerworld Inc. will do more than publish.

The new company set up to publish *Shukan Computer* is called Dempa Computerworld, Inc., and it will become involved in a variety of communications activities. It will conduct surveys on the Japanese computer market, hold seminars on new computer equipment and techniques, and, in early 1974, plans to run a "Computer Caravan" Forum and Exposition. Similar to the U.S. Caravan, the Japanese Caravan is tentatively scheduled for five of Japan's largest cities. Right now, *Computerworld's* U.S. and European Caravans are scheduled for 28 cities in 1973, and a total attendance of more than 85,000 professional visitors is expected.

Japanese computer market large and growing.

Right now, Japan is the largest single-country computer market outside the U.S. As pointed out by *Computerworld's* President, Patrick J. McGovern, "There are now over 15,000 computers installed in Japan, and the number is growing at over 25% per year. This growth and the current liberalizations of Japanese import policy on computer equipment makes Japan an especially attractive market for computer product and service marketers headquartered in the U.S. and Europe."

The Japan Ministry of International Trade and Industry indicates that by the end of 1975 there will be 38,000 computers worth over $12 billion in Japan. There will also be very rapid growth in the use of peripherals and terminals, and services and contract software, providing almost unlimited business opportunities.

Shukan Computer's Circulation starts at 35,000

Initial circulation of *Shukan Computer* is guaranteed at 35,000, which provides in-depth coverage of computer users and industry personnel. Based on IDC data file lists and the resource lists of Dempa, circulation is divided about 80% to end-users and 20% to the computer industry. Circulation development methods will be the same as those which gave *Computerworld* the highest paid circulation in its field in less than four years.

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Advertising sales for *Shukan Computer* will be handled in the United States by Computerworld Representatives. Rates are reasonable, based on a CPM of $35 (at current conversion levels—All rates are in Yen, and are estimated in dollars for convenience only). Full-page units are 9½" x 14½". Smaller units are available.

Also, *Shukan Computer* will provide translation services and aid in the establishment of marketing channels for companies new to the Japanese market.

Don't you always celebrate a birth with a cigar?

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As Pat McGovern puts it, *"Shukan Computer* will combine some of the best features of *Computerworld* with some of the proven successful techniques of Dempa Publications, to produce a publication that is unique in Japanese trade publishing. We expect it to be a great success!"

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IBMer Utilizes Microcode Capability And Converts 360/25 to APL Emulator

By Robert L. Glass
Special to Computerworld

SEATTLE – A member of the IBM Scientific Center in Palo Alto, Calif., has converted a 360/25 into an APL language emulator by utilizing the microcode and control store capabilities of the machine.

At a recent meeting of the Ruget Sound Chapter of the Association for Computing Machinery Dr. Tony Hassitt discussed his paper on "A High-Level Language Machine." The talk was a summary of his adventures and techniques in building an APL language computer.

Since the 25 is basically an emulator machine – even running in native mode, it is actually emulating the 360 in its microcode, according to Hassitt.

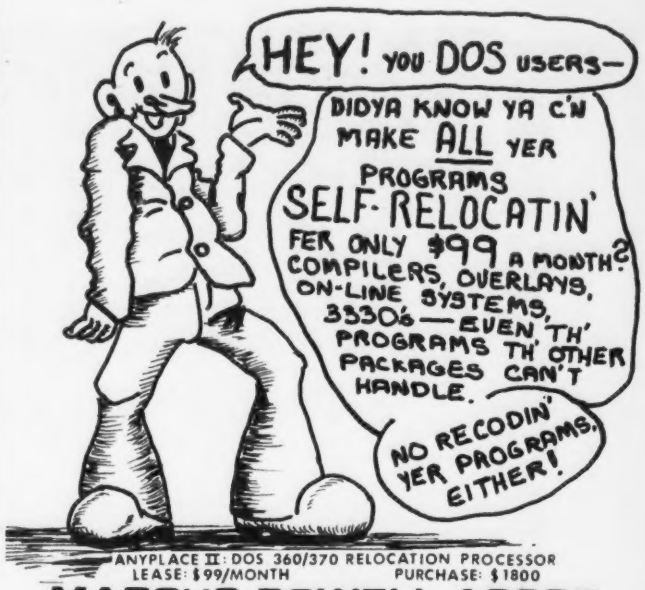
What Hassitt hoped to gain by his high-level language machine were the things a language interpreter does well – symbolic debugging, automatic bounds checking on subscripts and mode checking on arguments, automatic type conversions, dynamic storage allocation for vector and array manipulation.

What he did not expect to gain was speed. And he was right. For operations on scalar variables, the APL/25 works about two to three times slower than the 360/25 on similar operands; for vectors of more than about 10 elements, it does become a bit faster. But this still beats standard APL interpreters, which typically run at a 5-1 or 10-1 slowdown.

Microcoding is a fledgling art. The choice of what instructions to microcode had to be based on judgment and compromise. Microcode routines were developed to aid source syntax processing, space management, function calling and returning and monadic and dyadic operators.

The things microcode does best, Hassitt said, are bit testing and branching; register-to-register operations; logical manipulation; and memory-to-register operations; for these, it is eight to 42 times faster than "machine code." It is slower for things like floating point arithmetic, long string moves and I/O.

The future of the project, Hassitt said, is uncertain. He is continuing his research on another computer.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CRTs Do Have Their Captive Audience

KANSAS CITY, Mo. – Operators unfamiliar with CRTs tend to slow down initially while watching the tube, John Gray of Missouri Farmers Association told a Computer Caravan/73 data entry session here.

But once they're familiar with the scope, the benefits from using a key-to-disk system start mounting, he said.

When his shop first put in Inforex 1301s, he said he noticed a 35% slowdown in operator throughput, as they tended to get carried away watching the screen.

However, they soon concentrated on entering the data rather than watching their progress on the scope. The capabilities of the unit, such as allowing specification of a record size soon became apparent, he said.

Dick Baker of Chemagro also found an initial slowdown while his operators became accustomed to the screens of their IBM 2260s linked to his 360/30.

When You Hit 100, You'll Be Fired

LANSING, Mich. – During the processing of school bus driver records, it was discovered that about 130 of 130,000 drivers had more than six penalty points on their driving records over the past two years.

This information surfaced recently, wher the Michigan Department of Education ran its bus driver records through a computer.

One driver reportedly had accumulated more than 12 traffic law violations in two years, a point at which most licenses are suspended.

Originally initiated to help develop guidelines for schools in hiring drivers, the study, according to a source, was not expected to have much effect. Courts and labor arbitrators have held that school bus drivers cannot be fired for accumulating bad driving records if their records were good when they were hired.

Starry Eyes

Terri Taylor is the first entrant in the "Miss Greater San Diego" pageant and potential winner of the title "Her Majesty, the Most Beautiful Girl in the World." Microdata Corp. will provide a Microdata 1600 minicomputer and the necessary software to permit immediate tabulation of 1,000 ballot/min from the audience at the pageants. A series of computerized beauty contests will start next month and the winner will go on to the world final in Las Vegas.

Mich. Land Use on Reserved Basis

LANSING, Mich. – "With nine million resident people and only the same amount of land we had thousands of years ago, [the State of Michigan] can no longer afford to tolerate every use everywhere all at the same time," according to Sam Milstein, Department of Natural Resources (DNR) official.

So Michigan is doing something to preserve and best use its limited amount of land and the computer is playing a part. This year the DNR is instituting a computerized reservation system for the state's parks.

State residents will have to tell when and where they want to go and wait for the computer to tell them what resources are available.

Such controls would avoid incompatible uses of land such as snowmobilers using the same trails as cross-country skiers, he added. Recreation taken in "small doses by prescription" will not cause great harm to the environment.

And for You... 315 Credit Cards

CW West Coast Bureau

PORTLAND, Ore. – A mix-up at Standard Oil Co.'s computer center in Concord, Calif., brought Gregg Chastain a box of 315 credit cards to replace his expiring one.

A card embosser kicked out the 315 cards in error and a clerk, thinking they were for a commercial account, sent them to the Portland man.

A Standard spokesman said it was common to send large numbers of cards to commercial customers and the embosser was programmed to print them in multiples.

After finding all the cards in the box, Chastain packed them up and sent them back to Standard Oil, where his credit rating hit a new high.

Where the Buyers Are

TROY, Mich. – K-Mart stores claims to be one of the fastest-growing discount store chains in the world, and it owes its success largely to a complex computer operation, according to the company's 1972 annual report.

A prepunched ticket is removed from each item at the time of sale and mailed to a head office. A computer analyzes the information and reports are immediately generated advising merchandise personnel of quantities, colors and sizes of garments sold in each K-Mart store. Buyers can then merchandise individual stores effectively.

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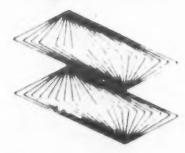

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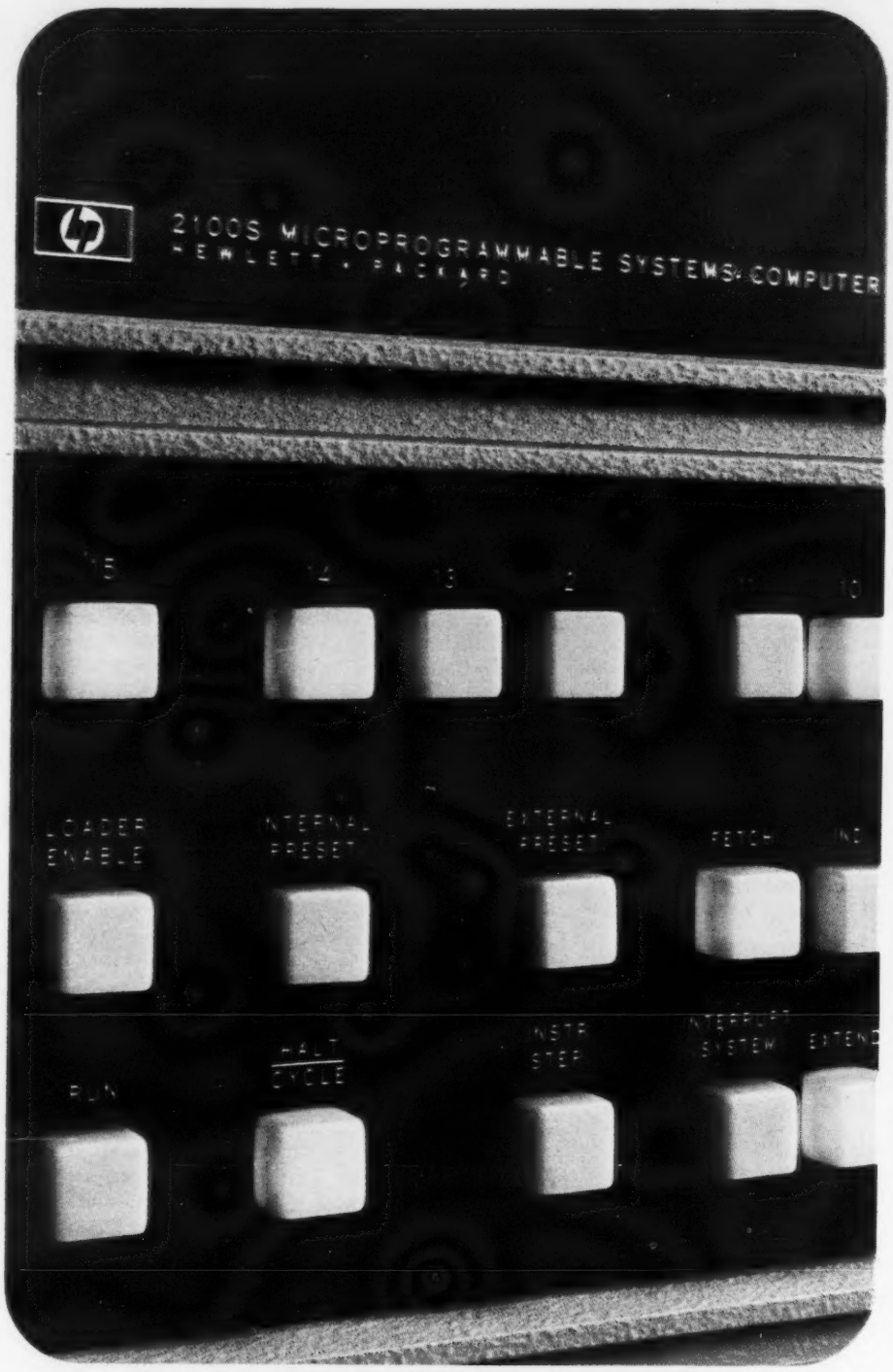

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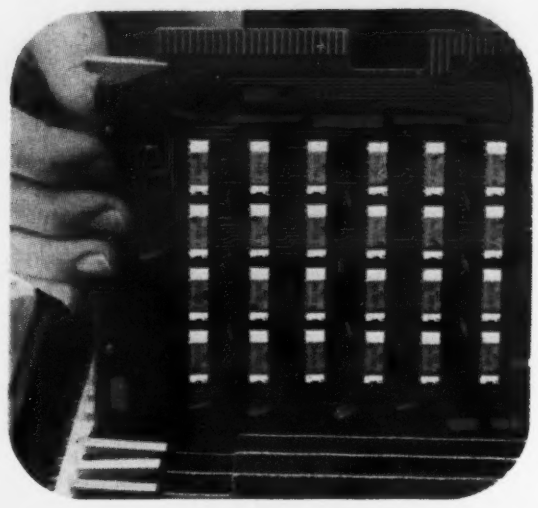

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CI Notes

U.S.-Japan Firm Based in N.J.

MOORESTOWN, N.J. – Part of the growing interest of Japanese computer firms in the U.S. marketplace and in U.S. products has been manifested here in the formation of Okidata Corp.

The firm is a joint venture of Oki Electric Industry Co. and David L. Nettleton, a U.S. industry executive.

Okidata will market Oki products in this country and will also purchase U.S. components and complete systems for incorporation into Oki products sold in Japan.

Nettleton indicated that Okidata would buy both on the OEM market and in the end-user market for some equipment that would be then used in Japan.

CA to Hang Mini on Board

NEWPORT BEACH, Calif. – Computer Automation will be announcing within the next 60 days a full-scale general-purpose LSI mini with processor and memory on a single board. It will be priced 50% lower than current prices in the OEM market, according to an industry source.

French Caravane Postponed

PARIS – The French Computer Caravan, scheduled to begin its tour in May, has been postponed until early in 1974, according to *Zero Un Informatique*, the French sponsor.

The postponement was made in response to requests from exhibitors, both committed and potential, for more time to organize their contributions toward the program and exhibits.

Circuitry Technique Patented

YORKTOWN, N.Y. – A patent has been issued to three IBM scientists for an invention to enhance the ability to make dense, high-reliability circuits.

The patent, No. 3,725,309, covers the addition of copper to the aluminum thin film interconnection lines used in microelectronic circuits.

The technique reduces electromigration which can cause breaks or shorts in the aluminum lines when subject to high current densities for long periods of time.

The patent was issued to Irving Ames, Francois M. d'Heurle and Richard E. Horstmann of the IBM Research Center in Yorktown Heights, N.Y.

Supershorts

First shipments of Interdata Corp.'s New Series Model 74 minicomputers occurred two months ahead of the forecast April schedule.

– – –

Control Data Corp. plans to build a computer terminal products manufacturing plant in Tucson, Ariz.

– – –

Computer Memories has named Randal Data Systems as sales representatives.

Favors Public Scrutiny

CIA Backs Consent Decree Disclosure Bill

By E. Drake Lundell Jr.
CW Washington Bureau

WASHINGTON, D.C. – Two consent decrees against IBM in the last 40 years have not worked as hoped, and therefore opening up the consent decree process for public scrutiny would be "highly desirable," the Computer Industry Association informed the Senate recently.

Speaking in favor of Senate bill 782, association President Dan McGurk noted that 17 years after the 1956 Consent Decree against IBM "we can see that the decree has not removed the dominance of the leading firm in business data processing." The bill was introduced by Sen. John V. Tunney (D-Calif.).

Whose Consent?

The basic industry structure, he noted, is the same as it was at the time that consent decree was signed, and in the period since then 13 private antitrust suits have been brought against "the dominant firm" and the government "has found it necessary to institute a third major antitrust action against the company bound by the prior two decrees.

"To put the situation in modest terms, after two consent decrees, a major unresolved problem lingers in the industry," he stated.

The new bill before the Senate would require that the public be given an opportunity to comment on consent decrees before the court accepts them in future cases. It would also require the Justice Department to give the court a statement on the probable effects of the consent decree on the industry in question and the general public.

If the judge found the planned consent decree between the government and a company did not help protect the public from the alleged practices of the firm, he could refuse to sign the decree which would make the two parties either have to try the case or negotiate another settlement.

In the CIA testimony during the first round of hearings on the legislation, the group said that if the government's present antitrust action against IBM were to result in a consent decree, "that decree would do much to shape the basic architecture of the computer business for decades to come; the number and disposition of companies in it; the terms upon which sales were made; the opportunities for entry and growth; and, in some significant degree, the nature and uses of the products the industry evolves."

Noting that most antitrust suits brought by the Federal Government were settled by the consent process, the association said public scrutiny of the provisions of such decrees and the public accountability contained in the proposed law would be "a desirable objective."

"Given the importance of antitrust enforcement, significant improvement in any major feature is worth striving for," the association noted.

"Given the failure of two consent decrees to create competitive conditions in the industry," the association said, "it is possible that a solution to which the parties can agree will not solve that problem and the necessary steps can be taken only by a court order based on a full trial."

"Let us take the time and money to do a thorough and effective job in major cases where the economic stakes for the nation run into the billions of dollars," the association said, adding that "to do otherwise is to be penny-wise and pound foolish."

IBM Continues to Lose Grasp On Federal Base; Univac No. 1

By a CW Staff Writer

WASHINGTON, D.C. – The Univac acquisition of the RCA computer base enabled it to slip by IBM in the standings of installed equipment in the U.S. Government, but even more significant may be the fact that IBM's share of this huge market has been declining steadily over the past half decade.

The figures contained in the latest government inventory confirm a trend toward the use of the minicomputer as opposed to larger systems for many jobs – a trend that may be echoed in general industry as well.

The inventory shows that the number of computers in use at the end of June last year reached a peak of 6,731, up from the 5,934 total installation the year before.

However, the figures indicated, the growth in the general management classification of computers – generally what would be called general-purpose computers – was negligible.

In this category the number of systems was up by only 44, from 3,389 to 3,433. At the same time the number in special classifications, which includes most minis, jumped dramatically from 2,545 to 3,298 over the same period.

In the race to be the largest government supplier, Univac with 18.8% on its own picked up the 3% of RCA giving it a total of 21.8%, or just enough to edge out IBM's 21.2% of the installed systems at the end of the 1972 fiscal year.

However, the total for Univac – and for the Univac/RCA combine – 49,003, dropped during the year and only became number one because of an even sharper drop in the IBM share of the market.

Univac's percentage dropped from 19.2% in 1970 while the RCA base was down from 3.5% of the total computers installed.

IBM, however, dropped from 26.4% of the market to its 21.2% last year and in total has dropped from a share of 54.8% of the market since 1960.

Digital Equipment Corp., the mini king, however, has shown significant increases in the same time period. Starting from a negligible base in 1960, the firm had .9% of the market in 1965, 9.5% in 1970 and 14.5% of the computers installed in 1972.

Burroughs' share of the market held fairly even at 4% this year compared with 3.9% the year before, but is way down from the 10.4% it had in 1960.

NCR showed a drastic drop in market share, dropping from 6.1% in 1970 to only 3.6% in the latest reporting period, while Honeywell showed an increase from 5.6% of the market in 1970 to 8.2%

The costs associated with the operation of general-purpose computers increased slightly during the year, from $2.38 billion in 1971 to $2.42 billion during the next fiscal year.

The government program of reutilizing certain equipment that cannot be fully utilized by the agency that owns it appears to be working. Equipment worth $172.1 million was used by different agencies in the past year – an increase of almost $10 million over the value of equipment reutilized the previous year.

Labeling Code Chosen For Grocery Industry

NEW YORK – Some semblance of standardization may be coming to the grocery industry, and the benefits for the food concerns, as well as the point-of-sale (POS) industry, could be significant.

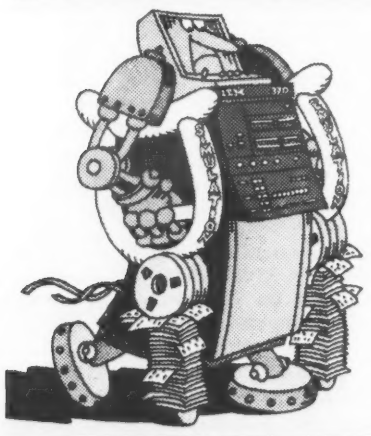
The Uniform Grocery Product Code Council, presented with several alternative designs by POS makers, chose a symbol of its own design as the future industry standard.

The selection of a linear bar code is said by some industry observers to give an edge to those firms that have designed equipment to operate on this principle, or suggested this type of symbol, such as Pitney Bowes-Alpex and IBM.

However, the proponents of a circular bar code, such as RCA and Litton, are expected to be ready with a product by the time the code becomes widely used.

The code, which will incorporate five digits for the manufacturer and five for the product, will be scannable by a device at the checkout counter linked to a central computer.

The grocery market for point-of-sale systems could reach $7 billion worldwide within 10 years, according to Charles S. Adams of Litton Industries.



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Honored For Software Sales

David Shefrin, president of Computer Systems and Education Corp. of East Hartford, was presented a plaque for CSEC's outstanding achievement in software sales for 1972.

The presentation was made at the million dollar awards cocktail party hosted by International Computer Programs held in New York for 33 eastern states computer software companies whose sales for 1972 topped one million dollars.

CSEC's AR-70 accounts receivable package is used by commercial companies for processing in-house receivables as well as by banks and service bureaus for use as a customer service.

Hierarchical Minis Expected by 1975

OCEANPORT, N.J. – The minicomputer industry by 1975 "will achieve hierarchical computer systems offering enormous power and flexibility at greatly reduced cost," according to Daniel Sinnott, Interdata president.

Such a development would be based on current developments in the semiconductor industry, including the so-called "computer-on-a-chip," he told Interdata users.

But he cautioned that the computer-on-a-chip was actually an arithmetic logic unit (ALU), "and a full-fledged computer system consists of much, much more than an ALU." That's why there will always be an opportunity for companies that offer a "broad spectrum of hardware and software capabilities."

The Interdata president listed the development of transistors and other solid state devices in 1959-60 as being "directly related to the development of the earliest minis." Similarly, the development of logic devices in packs in 1966-67 made possible the start of Interdata and its new wave of minis.

And the medium-scale integration (MSI) devices, including solid-state ROMs and RAMs of 1971-72, made possible the Interdata "New Series" processors, he added.

Now, Sinnott believes that the development of large-scale integration (LSI) devices will bring about hierarchical systems, featuring dozens of small computers working in tandem, by 1975.

3 British Firms Combine to Offer Range of Services From Single Unit

LONDON – Three British service companies have agreed to merge and form a new firm that will provide from a single source the firms' capabilities in the time-sharing, maintenance and equipment brokerage fields.

Known as Computer World Trade Ltd., the new firm will incorporate Computer Field Maintenance Ltd., Computer Resale Brokers International Ltd. and Computer Time & Hardware Brokers Ltd. The merger is set to take place as soon as possible, the firms reported.

Computer Time & Hardware Brokers will concentrate on the time-share side of its business after the merger, the firm said.

Bank's Role

The Hambros Bank, which has been involved in the development of both Computer Field Maintenance Ltd. and Computer Resale Brokers, will be an active partner in the new group, according to the bank. Revenue is expected to exceed $12 million in the first year, the firms indicated.

The new firm will offer marketing of new products on behalf of overseas companies, together with the marketing and brokering of used hardware; installation and maintenance facilities; design services for custom products and interfaces, as well as marketing of computer user's surplus time.

In the future, Computer World Trade Ltd. also plans to offer contracting services for installing DP centers, and establish commercial bureau and software facilities.

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F. Mainframe
G. Facilities Management

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Orders & Installations

St. John Fisher College, Rochester, N.Y., is installing a Xerox Sigma 3 system to meet increased administrative and student needs.

Harris Pine Mills of Pendleton, Ore., has ordered an NCR Century 200 for account processing and payroll preparation.

Automated Building Components, Inc., Miami, has ordered a Control Data Cyber 70 Model 72 to expand its processing capabilities.

The Southeast Bankcard Association has installed a Data Recognition Corp. Model 700 Optical Scanner/Micr Encoder.

The Dow Jones-Bunker Ramo News Retrieval Service, Inc., New York, has installed a Digital Equipment Corp. PDP-11/45 for the indexing and storage of news stories and headlines.

Southern Research Institute, Atlanta, has ordered a Batch-76 system from Digital Equipment Corp.

Arizona State University, Tempe, has ordered a Univac 1110 system, worth over $3 million, to service all educational and administrative requirements.

Manufacturers Hanover Trust Co. Inc., New York, has leased CMC 9 Key Processing Systems from Computer Machinery Corp. for use in its Manhattan data center.

The Electronics Systems Division of the Air Force Systems Command has ordered a Univac 1108 multiprocessor for installation at the Human Resources Laboratory at Lackland AFB, Texas.

Court Rules Sperry Rand Patent on Eniac Invalid

By a CW Staff Writer

MINNEAPOLIS – A Federal District Court judge here has ruled the Sperry Rand Eniac patent invalid, freeing computer companies from the necessity of obtaining a license on the patent in order to purchase computers.

The decision ends a 6-year-old case between Honeywell and Sperry Rand Corp. in which Honeywell charged antitrust violations against Sperry Rand, and Sperry Rand countersued for patent infringement.

In dismissing the Sperry Rand patent claim, the judge also dismissed the Honeywell antitrust claim. Neither firm would say last week whether appeals were planned.

Both of the firms have revealed the basic terms of the judgment, but it has not been officially filed yet with the court clerk here, and therefore its full terms are not yet on the public record. Sources said they did not know how soon the judgment would be put on file.

Full Terms Unavailable

And while the decision is said to be far-reaching, industry sources indicated only IBM was actually paying the firm for use of the patent – and that it was paying an estimated $1 million annually to use the patent.

A spokesman for Sperry Rand, however, said that IBM had made payments to Sperry of $11.1 million between 1956 and 1965 under two cross-license agreements covering items in addition to the Eniac patent. Sperry said it hadn't received royalties from any source since 1965 on the Eniac patent.

Judge Earl R. Larson ruled the patent invalid because, he said, the computer design, invented by the Sperry researchers in 1946, had been in use for more than a year before the patent claim was filed, a technicality that makes patent claims invalid.

Honeywell, the judge indicated, had failed to prove its antitrust charges which claimed that Sperry had shared information with IBM and had withheld the information from other computer manufacturers at the same time, sources close to the case said.

Little Attention

Although a significant case, the suit and countersuits have received little attention in the computer community since the original antitrust charge was filed in 1967 and the Sperry countersuit followed, seeking $20 million in damages for the alleged patent infringement.

A trial on the case started in June of 1971 and continued to March of the next year.

Several sources said last week the potential value of the patent could have reached into the hundreds of millions of dollars if Sperry Rand had won its suit against Honeywell, because it would then have been able to charge most of the other computer makers with infringement, also potentially leading to several multimillion dollar suits involving most of the firms that make – or have made – computer mainframes.

The dismissed patent claim involved a patent issued in 1964 to Illinois Scientific Development, Inc., a Sperry Rand subsidiary that actually held the Electronic Numerical Integrator and Computer (Eniac) patent.

Top 4 DP Firms Seen Losing Market Share

WASHINGTON, D.C. – A recent report from the U.S. Census Bureau on the "Value of Shipment Concentration Ratios" cites the computer industry as one segment in which the market share of the top four companies has declined.

The tables indicate the share held by the top four declined from 1967 to 1970 by 13.6%. The category of computers includes everything from small peripherals to large systems.

At issue in the Justice IBM suit, however, is whether the market itself actually considers as a whole such a wide range of products.

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Afips Reports

1971 DP Revenues Topped $10.3 Billion

MONTVALE, N.J. – Total revenues by computer firms for the U.S. market in 1971 amounted to $10.3 billion when the receipts from outright sales and rentals are combined, a recent report prepared by the American Federation of Information Processing Societies (Afips) indicated.

Incorporating opinions of four market research firms, "The State of the Computer Industry in the U.S." placed revenues of general-purpose systems at $5.3 billion in 1971, while minicomputer and dedicated application computer revenues were fixed at $250 million.

On-line peripherals from mainframe manufacturers accounted for revenues of $350 million, and from independent suppliers these devices brought in $165 million.

The makers of independent plug-compatible supplies had revenues of $180 million in the U.S., while the report estimated leasing revenues at $600 million and used computer revenues at $40 million.

In the services area, revenues from batch services were estimated at $950 million and those from on-line services at $500 million. Software was put at $750 million (including some $300 million from government contracts, some of them quite specialized).

The non-military portion of the software market should double by 1976.

Batch services are expected to double in revenues by 1976, but on-line services are expected to show an even better performance by tripling in revenues in the same time period.

Bell Honored; IBM Names Fellows

Several computer scientists have been selected for awards by their employers.

C. Gordon Bell was awarded the Carnegie-Mellon University's Mellon Institute Award for outstanding contributions to science and its application to the needs of mankind.

Bell, a professor of electrical engineering and computer science at Carnegie Mellon, was responsible for the design of Digital Equipment Corp.'s PDP-10 and the PDP-11.

IBM has named four fellows who will be free to pursue their own research interests for five years.

Robert A. Nelson was named for his work on the virtual machine, and William E. Harding, for semiconductor technology. Dr. Harlan D. Mills works with programming techniques, while Dr. Richard G. Brewer has made discoveries in the fields of nonlinear optics and laser spectroscopy.

Before
Our May 30th **Preview Issue** (B & W close May 18th. Color Close May 11th)

During
The June 6th **Show Issue** (B & W close May 25th. Color Close May 18th)

After
Our June 13th **Wrap-up Issue** (B & W close June 1st. Color Close May 25th)

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Contracts

Sperry Rand received a $14.1 million Navy contract for computer equipment for navigation systems on Poseidon missile submarines.

Washington Scientific Industries, Inc. will supply the Defense Supply Agency with over 11,000 microfiche readers as part of a major system to be used for publication, distribution and retrieval of data in the Defense Integrated Data System.

Digilog Systems, Inc. has agreed to provide 20 custom portable video display terminals to Xonics, Inc. under a $48,000 contract.

Management Systems Corp. has signed a five-year contract with Exchange Savings & Loan Association to provide complete data processing services.

Raytheon Co. will supply up to 49 graphic display consoles for the North American Air Defense Command under a $3.3 million subcontract with System Development Corp.

A $1.9 million subcontract for preliminary work on the Space Shuttle orbiter's flight control subsystem has been awarded to Honeywell, Inc.'s Aerospace Division by North American Rockwell.

ITT Creed, a British subsidiary of ITT, has received two contracts from the British Post Office for 9,000 teleprinters and associated equipment. The contracts are valued at $17 million.

The credit bureaus of Flint, Lansing and Pontiac, Mich., have entered an automation services agreement with Chilton Corp.

Computer Products, Inc. has contracted with Bailey Meter, Canada, to provide RTP interfacing equipment which will connect an SPC-16 minicomputer to monitoring devices within a power complex in the Far East.

Logicon, Inc. will furnish technical assistance and software validation services to the U.S. Air Force on the B-1 supersonic bomber program under a $185,500 contract.

Seven motor carriers have contracted jointly with Transport Data Communications, Inc. for computerized teleprocessing services worth over $2 million.

CDC Computer Business Boosts Earnings

MINNEAPOLIS – The computer segment of Control Data Corp. has emerged as the bright star in the firm's first-quarter earnings report.

Computer business earnings rose to $5.3 million compared with a loss of $1.6 million in the same year-ago period.

Total earnings reached $17.4 million or $1.08 a share compared with $11 million or 73 cents a share in the first quarter ended March 31, 1972.

Outright sales of DP equipment rose, and rental and service revenues increased as well, President William C. Norris said. A portion of the gain in the rental and service area was attributable to the recent acquisition of Service Bureau Corp., according to Norris.

Earnings from rentals and service totaled $33,405 up from $18,773 in the year-ago period, while earnings from sales rose to $30,135 from $18,066 last year.

Commercial Credit, a wholly owned subsidiary, earned $13 million in the quarter, down slightly from $13.7 million in the same period last year.

Although the unit's outstanding receivables as of the end of the period were up about 12% from a year ago, earnings continued under pressure as a result of currently higher short-term interest rates, Norris said.

EM&M Scores Turnaround, Reports $4.9 Million Earnings for Year

LOS ANGELES – Electronic Memories & Magnetics Corp. has returned to profitability for the year ended Dec. 30, with help from a $3.5 million special credit.

Earnings for the current year totaled $4.9 million or 70 cents a share, on increased revenues of $76.4 million. In 1971, the firm lost $9.6 million or $1.76 a share on revenues of $70.5 million.

The results for 1971 have been restated to reflect the reclassification of Electroglas, Inc. as discontinued operations. For 1972, the restated results also reflect year-end adjustments, including allocation of insurance proceeds the firm expects to receive for fire damage to a Hong Kong plant in March 1972.

The firm has reduced outstanding bank loans to $3.6 million at the end of December from $8.3 million a year ago, and has established a new line of credit to meet working capital requirements for 1973, President Trude C. Taylor said.

"Order input and shipments both were up favorably from the second half of 1971 and the first six months of 1972," Taylor said.

Bank Curbs Tally Short-Term Loans

KENT, Washington – The National Bank of Commerce of Seattle has informed Tally Corp. it has limited Tally's short-term borrowings and will terminate outstanding short-term loans on May 2.

Tally currently has about $750,000 in short-term loans outstanding from the bank, according to Clarence Robinson, Tally vice-president, finance.

The firm's future short-term credit line has been limited to about $750,000 by the bank, he said.

So far, Tally has not found additional financing, the firm said. "The failure to complete a satisfactory arrangement could result in serious financial difficulties for the company," a spokesman said.

Discussions for new credit arrangements are continuing with other financial institutions, he added.

Randolph's DP Holdings Reduced by Transaction

HARTFORD, Conn. – Randolph Computer Corp.'s DP holdings have been reduced again, with the sale of about 65% of the firm's assets to Bancal Tri-State Corp.'s Bank of California subsidiary.

The sale by Travelers Corp., Randolph's parent firm, involves most of the full-payout lease portfolio for about $21.5 million.

Last fall about 70% of Randolph's assets were acquired by the First National Bank of Boston.

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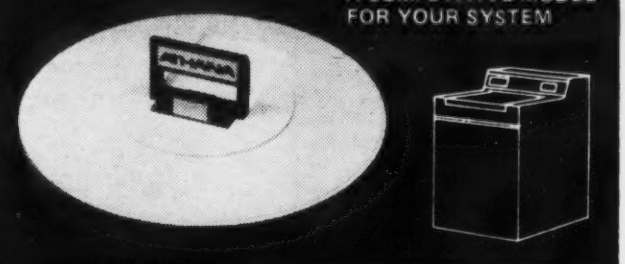

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NCR Returns To Profitability In First Quarter

DAYTON, Ohio – Freed from the burden of a strike that impacted last year's first quarter earnings, and aided by a 22% improvement in incoming orders, NCR returned to profitability in the first quarter of 1973 with earnings of $7.5 million or 32 cents a share.

Revenues reached $367.4 million, a new high for any first quarter and a 12% increase over revenues of $326.8 million in the first period last year.

Robert S. Oelman, chairman, and William S. Anderson, president, said all segments of the business showed improvement including international operations, which reported substantially increased shipments.

"Earnings are also beginning to benefit from the cost reduction programs undertaken throughout the company in recent months although most of this impact will be felt later in 1973," they said.

Strong Trends

The company reported strong incoming business for the first three months of 1973 with computer equipment, accounting machines and retail systems all achieving major advances.

On a consolidated basis, incoming orders were up 22% over last year's first quarter. Sales of business forms and supplies used with NCR systems also rose as did revenues from NCR's worldwide network of 85 data processing centers.

"The recovery experienced so far this year is on target," and is expected to continue, Oelman and Anderson said.

The company's effort to decentralize manufacturing and to integrate engineering with manufacturing at the plant level is nearing completion, they said.

It is anticipated that these extensive changes will result in lower production costs and faster response to changing market conditions.

Additional operational changes are being carried out in order to achieve greater productivity and further cost reductions in all areas of company activity, they said.

Foreign Orders & Installations

Honeywell has received an order from the Lanarkshire County Council in Scotland for the installation of a Model 6040 to replace an IBM 360/30. The system will be used in the financial administration of the council's projects.

Procesa, a data processing center in northeastern Spain, has ordered a Control Data SC-1700 to expand its data services.

The Compagnie Internationale de Services Informatique, a subsidiary of the French civilian Atomic Energy Commission, has installed a Control Data 7600. The system will be used for high-energy physics research.

AMP of Great Britain, Ltd., London, has ordered a Minicomm communications monitor from GTE Information Systems.

The Banco Espanol de Credito, the largest bank in Spain, has ordered a Univac 1106 for use in stock exchange recording.

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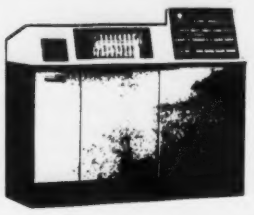

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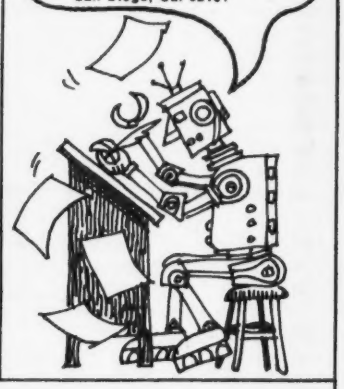

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IBM 1st Quarter Earnings Gain Outpaces Revenues 11.3% to 6%; Records Set

ARMONK, N.Y. – IBM has turned in record earnings in the first quarter ended March 31, with an 11.3% rise in earnings on a 6% gain in revenue over the same 1972 period.

Income from rentals and services alone also increased 11.3% over the same period last year. In all of 1972 the increase for this sector was 9.2%.

Outright purchases of DP equipment declined in the period compared with the year-ago quarter, President Frank T. Cary said. However, he added, "shipments for the year are expected to be at a high level, with several major newly announced System 370 products scheduled to be delivered in increasing quantities as the year progresses."

Several factors contributed to the higher rate of increase in earnings than revenue. An IBM spokesman mentioned a cost reduction program, strong performance from foreign operations, a lower tax rate and an increase to $48 million from $39 million in "other income."

Earnings for the quarter totaled $340.1 million or $2.92 a share compared with $305.7 million or $2.64 a share in the same 1972 period.

Revenues reached $2.45 billion, up from $2.31 billion a year ago.

The 11.3% growth in earnings compares with an 11.2% rise in the immediately preceding quarter; however, the rate of increase for 1972 as a whole totaled 18.6%.

The 6% gain in revenue matched the 6% increase of the preceding period, but for 1972 the rate of increase totaled 15.2%.

Burroughs Progress 'Ahead Of Plan,' Earnings Up 34%

DETROIT – Burroughs record first-quarter earnings and revenues are "somewhat ahead of plan," according to President Ray W. Macdonald.

Earnings from operations rose 34% and revenues 24% over performances in last year's first quarter.

Including a $2.4 million special credit from the sale of securities, earnings totaled $18.7 million or 99 cents a share compared with $12.2 million or 66 cents a share in the year-ago period.

Revenues rose to $274.4 million from $220.6 million in the first quarter of 1972.

Worldwide incoming orders increased 23% over the 1972 position, Macdonald said, while backlog since the beginning of the year increased 13%.

Although expectations for the full year are good, Macdonald cautioned that it was too early to determine whether the present trend would continue.

In 1972, Macdonald told shareholders recently, EDP shipments at sales value rose to $810 million, an increase of 19% over 1971. "We anticipate that these shipments will come close to, or possibly exceed, the billion dollar level in 1973," he said.

Research and development expenditures on systems, equipment and software will approximate $65 million in 1973, an increase of almost 20% over 1972, he said. Also anticipated is expansion of engineering and software staff by about 15%, he added.

Also in 1972, Burroughs reduced outstanding debt by $126 million, and a further reduction is anticipated in 1973, Macdonald reported.

"We are now in a position to satisfy fixed-asset growth needs, including an expanding rental equipment base, together with debt maturities, dividend payments and working capital requirements from funds generated within the business," he said.

"We forecast capital expenditures of approximately $180 million in 1973. Some $40 million of this will come under the heading of plant, tools and equipment, with the major portion being directed toward further reequipping our existing facilities and tooling for new products.

"The total also includes a further investment of $140 million in rental equipment and related inventories. Depreciation in 1973 will increase by approximately 12%, and amount to some $130 million," Macdonald said.

New Registrations

DATA PATHING INC., 370 San Aleso Ave., Sunnyvale, Calif., filed to register 1,095,904 shares of common to be offered by subscription to common shareholders at the rate of one share for each two shares held. Proceeds, at $2.50 per share, will be applied to the redemption of convertible notes held by the principal shareholders.

INPUT BUSINESS MACHINES, INC., 12111 Park Lawn Dr., Rockville, Md., input equipment manufacturer and marketer, filed to register 300,000 shares of common. Proceeds, at $10 per share, will be used for production and testing equipment. The underwriter is Hay, Fales & Co., Inc., 50 Broadway, New York 10004.

ITEL CORP., One Embarcadero Center, San Francisco, Calif., marketer and lessor of computer equipment, filed to register 300,000 shares of common in connection with the proposed acquisition of FNIC Investors, Inc.

HEWLETT-PACKARD CO., 1501 Page Mill Rd., Palo Alto, Calif., filed to register 62,859 shares of common. These shares are being offered in exchange for the outstanding shares of Field Emission Corp. at the rate of 6,308 Hewlett-Packard shares for each Field Emission share.

Bunker Ramo to Double Capital Expenditures

TRUMBULL, Conn. – Bunker Ramo Corp. is planning to more than double its capital spending program in 1973 over 1972, according to President George S. Trimble.

Total expenditures are expected to reach about $50 million this year, half of which will be for equipment on lease to users, such as stock market information systems.

As of Dec. 31 about 6,000 of the System/7 systems had been installed or were on order.

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Computerworld Stock Trading Summary

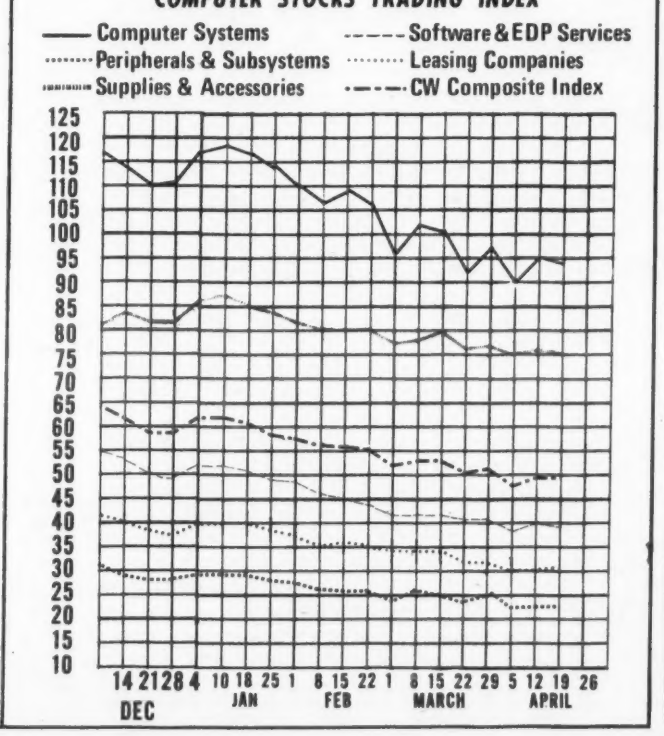
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, APRIL 19, 1973

EXCH		1972-73 RANGE (1)	CLOSE APR 19 1973	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	1 1/2	0	0.0
A	APPLIED DATA RES.	3- 7	3	+ 1/8	+4.3
O	APPLIED LOGIC	1- 4	2	- 1/8	-5.8
N	AUTOMATIC DATA PROC	65- 99	65 1/4	-6 3/4	-9.3
O	BRANDON APPLIED SYST	1- 2	5/8	0	0.0
O	COMPUTER DIMENSIONS	2- 14	2 5/8	+ 1/8	+5.0
O	COMPUTER DYNAMICS	1- 4	7/8	+ 1/8	+16.6
O	COMPUTER NETWORK	2- 7	1 3/4	0	0.0
N	COMPUTER SCIENCES	3- 10	3	- 1/4	-7.6
O	COMPUTER TASK GROUP	1- 2	1	- 1/2	-33.3
O	COMPUTER TECHNOLOGY	2- 8	2 5/8	+ 1/8	+5.0
O	COMPUTER USAGE	5- 14	6	+ 1/4	+4.3
O	COMRESS	1- 3	1/2	0	0.0
O	COMSHARE	5- 10	6 3/8	+ 3/8	+6.2
N	CORDURA CORP	6- 28	7 3/4	-1 1/8	-12.6
O	DATATAB	3- 9	2 3/4	+ 1/4	+10.0
O	EDP RESOURCES	1- 8	1 3/8	- 1/8	-8.3
A	ELECT COMP PROG	1- 5	1 3/8	- 1/2	-26.6
N	ELECTRONIC DATA SYS.	38- 65	38	-6 1/8	-13.8
O	INFORMATICS	3- 11	3 3/8	- 1/4	-6.8
O	I.O.A. DATA CORP	1- 3	3/4	- 1/8	-14.2
O	KEANE ASSOCIATES	3- 7	3	- 1/4	-7.6
O	KEYDATA CORP	7- 13	8	+ 1/8	+1.5
O	LOGICON	4- 9	4 3/4	+ 1/8	+2.7
A	MANAGEMENT DATA	2- 10	2 1/4	- 1/4	-10.0
O	NATIONAL CSS INC	8- 41	27 1/4	-1	-3.5
O	NATIONAL INFO SRVCS	1- 5	1 1/4	0	0.0
P	ON LINE SYSTEMS INC	5- 19	14 1/8	-1 1/4	-8.1
N	PLANNING RESEARCH	3- 17	4	+ 3/8	+10.3
O	PROGRAMMING METHODS	20- 25	22 1/8	- 1/8	-0.5
O	PROGRAMMING & SYS	1- 2	7/8	- 1/8	-12.5
O	RAPIDATA INC	5- 27	14 3/4	-2 1/4	-13.2
O	SCIENTIFIC COMPUTERS	1- 4	1 1/8	- 1/8	-10.0
O	SIMPLICITY COMPUTER	1- 5	2 1/8	+ 1/8	+6.2
O	TBS COMPUTER CENTERS	3- 6	3	+ 1/8	+4.3
O	TCC INC	1- 3	1/2	0	0.0
O	TYMSHARE INC	7- 12	7 5/8	+ 1/8	+1.6
O	UNITED DATA CENTER	5- 8	5	0	0.0
N	UNIVERSITY COMPUTING	7- 26	8	- 5/8	-7.2
A	URS SYSTEMS	5- 10	4 3/4	- 3/8	-7.3
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	19- 49	19 3/4	- 1/8	-0.6
O	ADVANCED MEMORY SYS	12- 23	14 3/8	- 3/4	-4.9
N	AMPEX CORP	4- 15	4	-1	-20.0
O	ANDERSON JACOBSON	4- 8	5 1/2	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 10	9 3/4	- 1/4	-2.5
A	BOLT,BERANEK & NEW	5- 21	8 7/8	- 1/8	-1.3
N	BUNKER-RAMO	6- 14	6	- 3/8	-5.8
A	CALCOMP	9- 25	10 3/4	0	0.0
O	CAMBRIDGE MEMORIES	9- 15	10 5/8	+ 1/8	+1.1
O	CENTRONICS DATA COMP	6- 28	26	+6 1/4	+31.6
O	CODEX CORP	6- 25	12	- 1/2	-4.0
O	COGNITRONICS	1- 5	1 1/2	- 1/8	-7.6
O	COMPUTER COMMUN.	1- 7	2 1/4	+ 1/4	+12.5
A	COMPUTER EQUIPMENT	2- 4	2 1/4	0	0.0
O	COMPUTER MACHINERY	7- 13	8 7/8	0	0.0
O	COMPUTER TRANSCEIVER	2- 9	2 1/8	- 1/8	-5.5
A	COMPUTEST	3- 9	4 3/4	- 1/8	-2.5
N	CONRAC CORP	23- 39	22 1/2	-1 1/4	-5.2
A	DATA PRODUCTS CORP	3- 7	3 1/4	+ 1/8	+4.0
O	DATA RECOGNITION	1- 5	1 1/2	-1	-40.0
O	DATA TECHNOLOGY	2- 5	2 7/8	- 1/4	-8.0
O	DI/AN CONTROLS	3- 8	2 3/4	0	0.0
N	ELECTRONIC M & M	3- 8	3 3/4	+ 1/8	+3.4
O	FABRI-TEK	2- 5	3	- 1/8	-4.0
O	GENERAL COMPUTER SYS	6- 16	6	-1	-14.2
N	GENERAL ELECTRIC	59- 74	64 1/8	- 1/8	-0.1
N	HAZELTINE CORP	7- 13	7 5/8	+ 1/8	+1.6
O	INFOREX INC	14- 36	16 1/4	+2 5/8	+19.2
O	INFORMATION DISPLAYS	1- 5	7/8	0	0.0
O	INFORMATION INTL INC	8- 25	11 3/4	+ 1/4	+2.1
A	LUNDY ELECTRONICS	5- 14	4 5/8	- 3/4	-13.9
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	15- 44	20 3/4	+1	+5.0
N	MOHAWK DATA SCI	6- 27	5 7/8	- 1/4	-4.0
O	ODEC COMPUTER SYST.	3- 12	4	+ 1/4	+6.6
O	OPTICAL SCANNING	2- 16	5 1/4	+ 1/4	+5.0
O	PERTEC CORP	5- 17	5 1/4	0	0.0
O	PHOTON	3- 15	3 3/4	(SUSPENDED)	
A	POTTER INSTRUMENT	5- 21	5 1/8	- 1/4	-4.6
O	PRECISION INST.	2- 13	2 1/2	0	0.0
O	RECOGNITION EQUIP	4- 15	4 1/2	- 1/4	-5.2
N	SANDERS ASSOCIATES	10- 21	9 5/8	- 7/8	-8.3
O	SCAN DATA	2- 13	2 1/2	+ 1/8	+5.2
O	STORAGE TECHNOLOGY	17- 39	21 1/2	- 1/2	-2.2
O	SYCOR INC	7- 12	13	+ 3/4	+6.1
O	TALLY CORP.	3- 15	3 1/8	- 1/8	-3.8
N	TEKTRONIX INC	34- 64	39	- 3/8	-0.9
N	TELEX	4- 15	4 3/8	+ 3/8	+9.3
O	WILTEK INC	10- 26	12 1/2	- 1/2	-3.8
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	5- 9	7	- 1/2	-6.6
A	BARRY WRIGHT	8- 14	8 3/8	- 3/4	-8.2
A	DATA DOCUMENTS	17- 26	19 7/8	+ 1/2	+2.5
O	DUPLEX PRODUCTS INC	8- 16	8	- 1/2	-5.8
N	ENNIS BUS. FORMS	6- 10	6	0	0.0
O	GRAHAM MAGNETICS	15- 27	14 1/2	- 1/2	-3.3
O	GRAPHIC CONTROLS	10- 15	10 1/8	+ 1/4	+2.5
N	3M COMPANY	76- 88	83	-1 3/8	-1.6
O	MOORE CORP LTD	42- 60	60 1/4	+1 1/4	+2.1
N	NASHUA CORP	43- 62	45 1/8	-2 3/8	-5.0
O	REYNOLDS & REYNOLD	37- 77	48 1/8	- 1/4	-0.5
O	STANDARD REGISTER	14- 20	19	+ 3/4	+4.1
O	TAB PRODUCTS CO	14- 23	14	0	0.0
N	UARCO	19- 28	19	- 3/8	-1.9
A	WABASH MAGNETICS	6- 11	6 1/4	- 1/4	-3.8
N	WALLACE BUS FORMS	21- 26	21 3/8	- 1/8	-0.5
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	147-244	229 3/4	-4 7/8	-2.0
N	COLLINS RADIO	14- 27	19 5/8	-1 7/8	-8.7
N	CONTROL DATA CORP	42- 78	48	-2 1/4	-4.4
O	DATA GENERAL CORP	36-131	38	-5	-11.6
O	DIGITAL COMP CONTROL	3- 25	3 1/4	- 1/8	-3.7
N	DIGITAL EQUIPMENT	72-105	82 7/8	-1 1/8	-1.3
N	ELECTRONIC ASSOC.	6- 13	6 1/4	- 1/4	-3.8
A	ELECTRONIC ENGINEER.	6- 14	10	- 3/4	-6.9
N	FOXBORO	23- 41	26 1/8	-1 1/4	-4.5
O	GENERAL AUTOMATION	13- 55	33 3/4	- 3/4	-2.1
O	GRI COMPUTER CORP	1- 5	1 1/4	- 1/8	-9.0
N	HEWLETT-PACKARD CO	46- 94	83 3/8	-1 1/8	-1.3
N	HONEYWELL INC	106-170	117 7/8	+ 3/4	+0.6
N	IBM	333-451	429	-3 1/4	-0.7
O	INTERDATA INC	7- 16	11 1/2	+ 1/2	+4.5
N	MEMOREX	6- 38	7	+ 1/2	+7.6
O	MICRODATA CORP	5- 10	6 3/4	0	0.0
N	NCR	27- 38	33 1/4	+1 3/4	+5.5
N	RAYTHEON CO	27- 47	29 3/4	-1	-3.2
N	SPERRY RAND	30- 50	41 1/2	+1 1/2	+3.7
A	SYSTEMS ENG. LABS	4- 16	4	- 1/4	-5.8
N	VARIAN ASSOCIATES	14- 22	14	0	0.0
N	WANG LABS.	18- 61	20	0	0.0
N	XEROX CORP	121-172	154 3/4	+1 3/8	+0.8
	LEASING COMPANIES				
A	BOOTHE COMPUTER	2- 18	2 3/8	0	0.0
O	BRESNAHAN COMP.	1- 3	2	+ 7/8	+77.7
O	COMDISCO INC	3- 18	10 1/4	-1	-8.8
O	COMMERCE GROUP CORP	3- 11	3 7/8	+ 5/8	+19.2
O	COMPUTER EXCHANGE	1- 3	5/8	0	0.0
A	COMPUTER INVSTRS GRP	4- 14	3 3/4	- 1/4	-6.2
O	COMP. INSTALLATIONS	2- 5	2	0	0.0
N	DPF INC	5- 13	6 1/2	+ 1/2	+8.3
M	DATRONIC RENTAL	2- 4	2 3/8	+ 3/8	+18.7
A	DCL INC	2- 10	1 5/8	0	0.0
A	DEARBORN-STORM	15- 26	17 1/4	- 1/8	-0.7
A	DPA, INC.	5- 8	5 1/2	+ 3/8	+7.3
A	GRANITE MGT	3- 11	3 1/2	0	0.0
A	GREYHOUND COMPUTER	4- 11	4 1/2	- 1/8	-2.7
A	ITEL	7- 12	7 3/8	0	0.0
N	LEASCO CORP	9- 24	10 1/2	+ 3/4	+7.6
O	LEASPAC CORP	6- 15	7	- 3/8	-5.0
O	LECTRO MGT INC	1- 4	1	- 1/8	-11.1
A	ROCKWOOD COMPUTER	2- 7	1 1/2	- 3/8	-20.0
O	SYSTEMS CAPITAL	3- 20	8 3/8	+ 1/8	+1.5
N	U.S. LEASING	19- 35	26 1/4	+ 5/8	+2.4

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

COMPUTER STOCKS TRADING INDEX



Earnings Reports

HEWLETT-PACKARD
Three Months Ended Jan. 31

	1973	1972
Shr Ernd	a$.33	$.25
Revenue	126,966,000	97,964,000
Spec Cred	.....	b427,000
Earnings	a8,685,000	6,629,000

a-Revised by company. b-Gain from revaluation of currencies.

COMPUTING & SOFTWARE
Three Months Ended Jan. 31

	1973	a1972
Shr Ernd	$.30	$.27
Revenue	26,278,000	22,696,000
Disc Op	.....	(48,000)
Earnings	1,819,000	1,695,000

a-Restated.

WUI
Year Ended Dec. 31

	1972	1971
Shr Ernd	$1.72	$2.00
Revenue	63,641,000	57,634,000
Spec Cred	.....	a2,392,000
Earnings	5,282,000	5,980,000

a-Primarily from sale of foreign real estate leasehold.

RECOGNITION EQUIPMENT
Three Months Ended Jan. 31

	1973	a1972
Shr Ernd	$.10	$.02
Revenue	7,517,000	8,667,000
bSpec Cred	1,205,000	220,000
Earnings	480,000	97,000

a-Restated to reflect 49.7% investment in Corporation S, based on equity method of accounting. b-In 1973, tax credit and gain from sale of stock; in 1972, tax credit.

BALTIMORE BUSINESS FORMS
Year Ended Dec. 31

	1972	1971
Shr Ernd	$.02	$.47
Revenue	18,273,708	17,224,278
Spec Cred	a23,881	.....
Earnings	57,704	366,520

a-Gain from sale of property.

INFORMATION MAGNETICS
Year Ended Dec. 30

	1972	1971
Shr Ernd	$.21	$.21
Revenue	5,805,938	3,613,975
Earnings	232,092	154,890

TERMINAL EQUIPMENT
Three Months Ended Dec. 31

	1972	1971
Shr Ernd	$.06	.....
Revenue	341,438	$67,207
Earnings	30,563	(134,527)

RAPID DATA SYSTEMS & EQUIPMENT
Six Months Ended Dec. 31

	1972	1971
Shr Ernd	$.46	$.18
Revenue	14,322,476	5,498,028
Tax Credit	325,000	194,000
Earnings	804,725	294,532

UNIVERSITY COMPUTING
Year Ended Dec. 31

	1972 (000)	a1971 (000)
Shr Ernd	.....	$.31
bRevenue	$101,031	109,732
Disc Op	(17,413,000)	1,649,000)
Spec Chg	d51,032,000	.....
Earnings	(82,781,000)	2,312,000

a-Restated. b-From continuing operations. d-Loss related to sale of computer terminal manufacturing business, sale of life insurance subsidiary and writedown of goodwill.

ANALOG DEVICES
Three Months Ended Feb. 3

	1973	1972
Shr Ernd	$.22	$.14
Revenue	4,553,538	3,379,989
Earnings	293,454	177,134

ELDORADO ELECTRODATA
Three Months Ended Jan. 31

	1973	1972
Shr Ernd	$.20	$.12
Revenue	2,918,324	1,677,617
Earnings	208,997	112,530
9 Mo Shr	.60	.12
Revenue	7,959,037	3,609,067
Earnings	621,720	114,094

ALANTHUS
Six Months Ended Feb. 28

	1973	a1972
Shr Ernd	$.64	$.63
Revenue	3,656,459	1,391,738
Spec Cred	160,218	68,321
Earnings	667,204	437,300

a-Restated.

DATAPOINT
Three Months Ended Jan. 31

	1973	1972
Shr Ernd	a$.23	.....
Revenue	4,085,000	$1,105,000
Spec Cred	b190,000	.....
Earnings	389,000	(600,000)
6 Mo Shr	a.33	.....
Revenue	6,917,000	1,825,000
Spec Cred	b267,000	.....
Earnings	545,000	(1,226,000)

a-Adjusted for a one-for-two and one-half reverse stock split in February 1973. b-From tax-loss carryforward.

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CIG's NEW 4 YEAR 370 LEASE CAN SAVE YOU A FORTUNE. LOOK AT THE BOTTOM LINE.

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IBM SYSTEM	370/135	370/145	370/155	370/158	370/165	370/168
IBM MONTHLY CHARGE	$14,933	$27,969	$71,754*	$61,458	$124,355*	$104,230
CIG MONTHLY CHARGE	$11,742	$22,162	$39,671	$49,503	$74,693	$84,934
CIG 48 MONTH SAVINGS	**$153,168**	**$278,736**	**$1,540,147**	**$574,800**	**$2,479,776**	**$926,208**

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